APRIL 10, 1922

AVIATION

VOL. XII. NO. 15

Member of the Audit Bureau of Circulations

CONTENTS

Editorials	419	"Who's Who in American Aeronautics"	427
The Aeronautical Convention of Sioux City	420	Notices to Aviators	428
Back Pay for Army Air Service Cadets	421	A Hobart Baker Memorial	430
The Loth Guide Cable for Flying in Fog	422	Sperry Demonstrates the "Messenger"	430
Louis Gaubert in France	423	Flying Boat Service on Pacific Coast	430
Air Service to Sell Standard Jl's	423	Army and Navy Air News	431
Chicago Air Board Honors Schroeder	423	Coming Aeronautical Events	433
Amundsen to Take Airplanes to Pole	423	Foreign News	434
Practical Uses of Aerial Photography	424		

THE GARDNER, MOFFAT COMPANY, Inc., *Publishers*
HIGHLAND, N. Y.
225 FOURTH AVENUE, NEW YORK

Subscription price: Four dollars per year. Single copies fifteen cents. Canada, five dollars. Foreign, six dollars a year. *Copyright 1922, by the Gardner, Moffat Company, Inc.*

Issued every Monday. Forms close ten days previously. Entered as second-class matter Nov. 22, 1920, at the Post Office at Highland, N. Y., under act of March 3, 1879.

THOMAS-MORSE AIRCRAFT CORPORATION

THOMAS-MORSE AIRCRAFT CORPORATION

Curtiss

ANNOUNCING 1922 PRICE LIST

NEW PRODUCTION

	LIST PRICE	
ORIOLE:		
With OX5 Motor	$3000.00	F.O.B. Buffalo, New York
" K-6 " (1919)	4400.00	" " "
" C-6 " (1920) and large surfaces	4800.00	" " "
SEAGULL:		
1919 K-6 Motor, dual stick control	5200.00	F.O.B. Garden City, L. I.
1920 C-6 Motor, dual dep control and balanced ailerons	5600.00	" " " "
STANDARD:		
With C-6 or K-6 Motor	3600.00	F.O.B. Garden City, L. I.
MOTORS:		
C-6 or K-6 (150 H.P.)	3000.00	F.O.B. Buffalo, New York

GOVERNMENT TRAINING PLANES

JN's:		
JN4D with new OX5 Motor	$2400.00	F.O.B. Dallas, Texas
JN4A, B, C & D used, with overhauled OX5 Motor	650.00 to 2200.00	F.O.B. " "
STANDARDS:		
With new OX5 Motor	$2000.00	F.O.B. Houston, Texas
" overhauled OX5 Motor	1700.00	" " "
Without motor, rebuilt for OX5	1100.00	" " "
" " " " K-6 or C-6	1600.00	F.O.B. Garden City, L. I.
" ", as received from Government	800.00	" Houston, Texas.
MOTORS:		
OX5 New	$ 800.00	F.O.B. Various concentration fields
OX5 Overhauled	600.00	" " " "
OX5 As received from Government	500.00	" " " "

NOTE: Where delivery is made from other than F.O.B. points, accrued transportation charges must be added.

SALES REPRESENTATIVES WANTED—IF INTERESTED WRITE FOR FULL DETAILS ON NEW SELLING POLICY.

CURTISS AEROPLANE AND MOTOR CORPORATION

GARDEN CITY, LONG ISLAND, NEW YORK

L. D. GARDNER
PRESIDENT
W. D. MOFFAT
VICE-PRESIDENT
W. I. SEAMAN
TREASURER
GEORGE NEWBOLD
BUSINESS MANAGER

AVIATION

LADISLAS D'ORCY
EDITOR
VIRGINIUS E. CLARK
EDWARD P. WARNER
RALPH H. UPSON
CONTRIBUTING EDITORS

Vol. XII APRIL 10, 1922 No. 15

A New Airship Design

THE Type AC military airship just completed at the Goodyear plant, which was described last week, appeals to us as the most finished job of airship building ever turned out in this country. Every detail, from instrument board to envelope seams, is worked out to a nicety that is apparent even to the most casual observer. The close fitting compact car with inboard engines gives the whole design a particularly "clean," business-like appearance. General simplicity and convenience of arrangement are also evidenced in the gear system, controls, single ballonet, and mooring connections.

The greatest novelty (for this country) is the transmission system. As far as we know, this system has never proved entirely satisfactory before. We can only say in this case that it has been put through very severe tests and that it has stood up remarkably well. The engines are also said to produce a surprisingly small amount of noise in the front cabin. The most obvious disadvantage of the arrangement is the considerable weight involved, which appears to us to consume all the saving from the increased propeller efficiency, except for trips approaching the limit of duration.

Another criticism that might be made of the design is the apparently increased fire-risk (in spite of numerous precautions) due to the combination of fuel, engines and air-intake in a single wooden car which is mounted directly against an inflammable envelope. It may be noted however that essentially the same arrangement has been used successfully in the Italian Forlanini ships.

Taken as a whole, the Goodyear Type AC airship represents a notable effort toward a new and improved type of nonrigid, and as such it marks a distinct departure from the classic ship of this type, with its low hanging car and numerous exposed rigging guys. In the Type AC parasite resistance has been reduced to a much lower figure than had hitherto been thought possible, at any rate in a nonrigid, hence the all round efficiency of the new ship should be relatively high. The first trials are encouraging in this respect, and additional test flights will therefore be looked forward to with considerable interest.

Coast Artillery vs. Aircraft

ACCORDING to an announcement just made public by the War Department, a series of coordinating training tests will be carried out next summer by the Air Service and the Coast Artillery for the purpose of determining the potentialities of aircraft in coast defense work.

We are certain that these tests, if carried to a decisive point, will be as conclusive as were the bombing tests made against warships off the Virginia Capes last summer. In fact they can have an equal importance in giving an illustration of up to date weapons of national defense if the Air Service is permitted to mobilize its resources for a real demonstration.

The contest between the bombing airplanes of the First Provisional Brigade, A.S., and the seacraft designated to act as their targets, gave a remarkable demonstration of the striking power of bombardment aircraft, and afforded at the same time a glimpse into their future possibilities. While coast fortifications are much less vulnerable against vertical attack than are warships, the immobility of the former is an asset to the aerial attacker, just as the mobility of warships is a handicap. The different conditions applying in the case of coast fortifications with respect to aerial bombardment make simulated engagements not only highly instructive, but will also come much nearer representing actual war conditions than could be the case with the warships bombed last summer.

If the Air Service is to have a real place in the scheme of national defense, its first function must needs be to defend our coasts against hostile attack. Those who can visualize the potentialities of aerial attack in the very near future, do not hesitate to claim that aircraft have rendered the present type of coast defense gun obsolete. It is obvious that since an air force stationed at suitable bases can take the air and go out to attack a hostile fleet while it is still one hundred miles off shore, the costly coast artillery defenses seem a superfluous equipment. The coast batteries cannot fire beyond an effective range much in excess of twenty miles, and they can, furthermore, defend but limited sections of the coast, so that a hostile landing can always take place in undefended sections. The mobility and speed of aircraft, allied with their offensive power modifies this situation, however, in favor of the defense. The only point yet to be demonstrated is the effect of aerial bombs against coast defense works, and this is one of the chief problems which the forthcoming maneuvers are to work out.

It is to be hoped that a record will be kept of the comparative costs of the respective equipment employed in these tests as well as of the performance, for even with the same effectiveness, the arm which costs the least should naturally be given preference.

Air Commodore Charlton

AIR COMMODORE L. E. O. CHARLTON, R.A.F., who has been air attaché at the British Embassy in Washington for the last two years, is preparing to leave this country, having been assigned to a new duty. Commodore Charlton's good fellowship and keen sense of humor have created him friends wherever his duties have called him, and his professional ability was highly appreciated by our own air officers. His departure will cause genuine regret among all those who have had the good fortune of having met him. Every good wish goes with Commodore Charlton to his new field of action.

The Aeronautical Convention at Sioux City

Commercial Aeronautical Association of 7th Corps Area Organized -- Its Plans for the Development of Aviation

Pointing to the organization of the Commercial Aeronautical Association of the Seventh Army Corps area at a convention in Sioux City, Ia., March 27, 28 and 29, as the first tangible action showing that America is awakening to the possibilities of commercial aerial navigation, speakers at the Sioux City convention expressed the belief that the other eight army corps areas soon will follow in the steps of the Seventh district.

The Program Adopted

The constitution of the Seventh Corps area association provides that the organization will foster and develop areonautics, both commercially and scientifically, first by bringing about the establishment of uniform landing fields in the fifty-seven leading cities of the area; cooperate with the other corps areas in promoting the establishment of a transcontinental air system and auxiliaries, and work with the war and navy departments in establishing an aerial defense for America, as well as to develop a citizenry trained in flying.

Resolutions adopted by the convention embodied the policy to be pursued by the new organization. It will seek affiliation with the Aeronautical Association of the United States of America following organization of that body at the convention in Detroit in September. The new body announced its intention to cooperate with city, state and national governments to promote aviation; urged Congress to expedite the passage of the Wadsworth-Hicks bill; asked that the aerial mail service be supported with adequate appropriations, and that the national government adopt a liberal policy toward aviation that will enable America to take the place it deserves in the flying world.

Admiral Fullam's Speech

In predicting the extensive development of aeronautics in the near future, Rear Admiral W. F. Fullam, one of the speakers declared that the science of flying will be so advanced both as regards heavier than air and lighter than air craft that there will be intimate and general communication between all cities and towns of the country by means of aircraft.

"This aircraft communication," said the Admiral, "will involve a transportation of mail, passengers, and, to a certain extent, freight, between communities and different sections of the country, saving a great deal of time and money.

"It is believed, therefore, that the organization of the Commercial Aeronautical Association of the Seventh Army Corps area in Sioux City is a movement that will ultimately be of great benefit to every town and city that joins in the movement and connects itself up with other new and quick means of communication and transportation. It is the dawn of a new era in transportation which will benefit all business interests.

"It is clear that in a few years the enormous and expensive battleships of the present day will be so completely at the mercy of air attack, combined with submarine attack and mines and torpedoes that no more ships of this type will be built after the ten-year naval holiday. Of all these new weapons it is believed that air forces are the most important, for with these alone a nation can absolutely protect itself from naval raids and from invasion by armies overseas.

"No fleet and no convoy can bring with them across the sea sufficient air forces to command the air after they reach our coast, provided this country supplies itself with strong air forces for the use of the army and navy. In this connection commercial aviation, involving the use of both heavier than air and lighter than air machines is of the most vital importance to our country, because all such forces, with their personnel, could be rallied as a reserve in time of war.

"It is by belief that aviation has great and practical uses and that safety in flying has been secured to such an extent that we may discount all fear as to the dangers involved. In Europe, men of big interests are flying all over the continent. Lighter-than-air craft development will unquestionably be recognized soon as a safe and reliable means of transportation."

Admiral Fullam read a statement from the Aero Club of America, in which the attitude of the Aero Club toward the formation of a new national organization known as the Aeronautical Association of the United States of America was explained. The Aero Club, according to the paper, is willing to become a part of the national organization but desires to retain its individualism temporarily, at least.

Airship Transportation

In amplifying the statements of Admiral Fullam concerning lighter-than-air craft as a possible means of an extensive transportation system, Brigadier General W. L. Kenly, explained the work two years ago of the board of engineers representing the American Investigating Corporation.

"One of the results of this report has been the formation of the General Air Service, a large corporation. The concern has acquired certain rights on German appliances and now is devoting its attention to the possibilities of commercial helium.

"I am one of those who believe that helium can be produced on a commercial basis. With helium and the properly constructed ship we can travel anywhere with perfect safety."

Growth of Aeronautics

The growth of areonauties in America in 1921 as compared with 1920 was the subject of a paper by Samuel S. Bradley, general manager of the Aeronautical Chamber of Commerce, which was read at the meeting by J. B. Harvey, of Kansas City.

"We estimate, from reports received by the Aeronautical Chamber of Commerce, that there was about 20 per cent more flying in the United States in 1921 than during the previous year," said Mr. Bradley's paper. "This is a remarkable fact when one recalls the general business and industrial depression. Aircraft now fly over the entire country. People see planes speeding along smoothly far overhead in districts where even wagon roads are impassable, in weather which ties up railroads and shipping.

"The public has changed its mind in regard to flying. A year ago many persons believed that the present generation, which has witnessed the development of the motor car, wireless and other astounding inventions, would not accept the flying machine. It was a bit too much to expect of a race that had always kept one foot on the ground, so to speak. Nevertheless, the airplane has been accepted.

"The gypsy flier is being absorbed by established companies. This is not a narrowing process, but rather a broadening one, where flying is being sold through responsible channels instead of peddlers. The passing of the gypsy flier is comparable to the supplanting of the stage-coach by the railroad.

"Our figures show further that some 275,000 persons traveled by air in 1921.

"Approximately 130 companies or individuals are permanently established, and operate about one-half of the civilian planes of the country. In other words they operate between 500 and 600 of the 1200 machines. They report to us that in 1921 they carried 122,512 passengers and 123,221 pounds of freight. They traversed air routes and made short flights aggregating 2,907,245 miles. The average cost per passenger was 55 cents a mile as compared with 65 cents a mile in 1920. The average charge per flight was $9.

The Officers Elected

Officers of the Seventh corps area organization were elected as follows: Ralph W. Crum, of Davenport, Ia., president; M. F. Stack, of St. Louis, first vice-president; J. B. Harvey, of Kansas City, second vice-president; W. B. Swaney, of Fort Dodge, Ia., third vice-president; John W. Coleman, of Sioux City, secretary, and C. H. Wolfley, of St. Joseph, Mo., treasurer. The board of directors will consist of the officers above named and E. R. Schultz, of Sioux City; J. L. McNeill, of Des Moines, and A. R. Dunphy, of Omaha.

The various cities of the area will be entitled to membership in the organization through their aeronautical organizations or chambers of commerce, it was tentatively agreed in making up a set of by-laws. It is planned to have but one local organization in each city affiliated with the corps area association, and membership of the local body to consist of not less than twenty-five persons. Personal memberships in the corps area also will be taken at $5 each, it was decided.

The extent of representation on the part of local bodies is to be governed by the population of their cities, being allowed one delegate for a population of 10,000 or under, and one additional delegate for each additional 10,000 of population.

It is planned to divide the cities into three classes, the first class to be those of 50,000 or more; the second, those of 12,000 to 50,000, and the third, 12,000 or under. Cities of the first class would be required to provide hangar facilities for not less than six commercial ships; repair hangars to care for at least two planes at a time; oil and gas filling stations; identification markers, complying with international rules; a superintendent of field on the ground at all times, and the location of the field to be convenient for surface transportation.

Cities of group two would need hangar facilities for not less than three ships; emergency repair shops; gas and oil supplies; identification markers; wind zones and telephone and wireless equipment.

The organization would require in cities of the third class an emergency landing field.

The office of the secretary, John W. Coleman, is at 315 Metropolitan Building, Sioux City, Ia.

Back Pay for Army Air Service Cadets

Decision Rendered by U. S. Court of Claims Favors Claim for Recovery of Back Pay and Flying Increase

In a suit against the United States brought by a former Air Service Cadet of the U. S. Army, a decision was recently rendered by the United States Court of Claims at Washington in favor of the cadet for recovery of cadet pay and flying increase which was claimed by him. This was the case of Nelson W. Rider vs. United States, which was tried and argued last month.

Recovery for Pay at $100 per Month

The recovery was for cadet pay at $100 per month for cadet service subsequent to June 30, 1918, after the government departments had ruled that the lawful rate of pay for the Air Service Cadet after June 30, 1917 was but $33 per month. Also recovery was made for flying increase at $50 per month additional for cadet flight duty, both before and after June 30, 1918. This also had been denied by the departments.

The final decision in the matter by the departments was the decision and opinion of the Comptroller of the Treasury of March 12, 1920 in the case of Ben Coleman, a former cadet and officer, in which the Comptroller held that the lawful pay of a cadet after June 30, 1918 was but $33 per month and that a cadet was not entitled to flying increase upon the pay at $100 per month for service up to June 30, 1918.

The United States Court of Claims in the Rider case holds oppositely in both matters. In its decision the former cadet is entitled to pay at $100 per month under then existing law and also to flying increase at $50 per month additional, or in all $150 per month while on flight duty and $100 per month merely while at ground school, whether before or after June 30, 1918. The court gave him judgment against the United States for $306.82.

The Colman case decided by the Comptroller and the Rider case decided by the Court were in the hands of the same lawyer, who after protracted action in the departments and rejection there took the Rider case and others entirely new into the United States Court of Claims.

Nelson W. Rider, the plaintiff, was a cadet from February to September, 1918, and was commissioned a 2nd Lieutenant, Air Service, U. S. Army, on Sept., 1918. His flight duty as cadet was from May to Sept., 1918. He qualified for Pursuit Pilot. He flew as cadet more than 80 flights.

The Variations of Cadet Pay

Former Air Service Cadets who served in the Spring of 1918 will remember April 1, 1918, the date of the first cut in the pay of a cadet below the rate theretofore received of $100 per month which was the rate agreed upon in most cases at the time of the cadet's enlistment.

The second cut in the pay of the cadet came on July 1, 1918, when all cadets in the Air Service were reduced to pay at $33 per month, the pay of a Private 1st class. Some months later the 50 per cent flying increase amounting to $16.50 per month additional was found to be due and in most cases paid. Some months later still, the cut of April 1, 1918, was found to be wrongful, and in most cases cadets were paid the difference at $100 per month to June 30, 1918, after discharge from the service.

No cadet ever received flying increase of 50 per cent in pay at $100 per month while in the service. This was secured for the first time by legal action in the Rider case who recovered $50 per month flying increase additional. The only flying increase received by former cadets was a 50 per cent flying increase in pay at $33 per month for cadet flight duty after June 30, 1918.

The cut of July 1, 1918, in the pay of the Air Service Cadet was adhered to by the departments and the Comptroller (then Comptroller of the Treasury), the supreme authority in the departments, in his decision in the Colman case held against flying increase and pay at $100 per month to Air Service Cadets. This opinion rules in the departments absolutely.

Government to Ask for New Trial

The government, it is understood, is prepared to move before the U. S. Court of Claims for a new trial, and if the motion is overruled, to exercise the right the government has in all cases to appeal to the Supreme Court of the United States within the time allowed by the rules of the court.

The lawyer in charge of this case and others was able to win the decision of the court after three years of litigation. It is his opinion, as reported, that every former Air Service Cadet of the U. S. Army who served during the war has a right of action in the Court of Claims within the statutory period from date it accrued to make recovery, some for flying increase alone at $50 per month additional and others for both pay and flying increase less amounts that have been received.

In connection with the refunding of back pay a former Air Service Cadet writes to AVIATION to the effect that he has received a letter from the Finance Department of the Army which advises him to file claim with the general accounting office of the War Department, stating the exact nature of the military service of the claimant.

The Loth Guide Cable for Flying in Fog

French Invention for Guiding Aircraft Through Fog Described -- System Functions in Preliminary Trial

The Loth guide cable is an adaptation to aircraft use of the guiding device experimented with during the late war in some Allied ports for the purpose of directing ships during foggy weather. Its adaptation to aircraft was made by Lieut. Arthur W. Loth, an engineer officer of the French navy, who had previously perfected the ship guiding device for use in the French navy.

The Fundamental Principle

The fundamental principle of the Loth guide cable rests on the fact that if a high-frequency alternating current is sent through a cable earthed at each end, a magnetic field of considerable intensity is created around the cable. The effects of this field can be detected by means of suitable instruments at considerable distances from the cable. Thus if an aircraft is

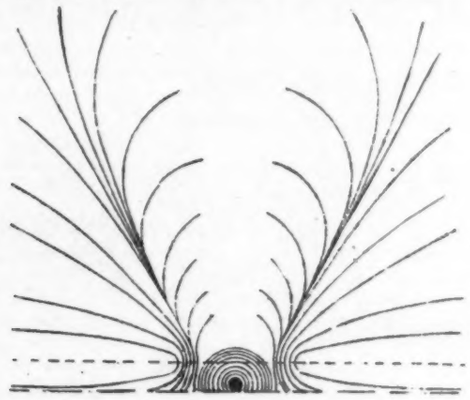


Fig. 1. Magnetic field produced in space by cable

equipped with these instruments, its navigator can determine his position relatives to the cable, and thus ascertain his bearings.

Although the principles are very simple, M. Loth was faced with numerous problems before bringing his system to perfection. Thus he had to do a tremendous amount of research and experimental work in connection with the formation and extent of the magnetic field surrounding the cable. This work took a long time, as measurements were often taken at intervals of a meter or so. The lines of force, shown in the accompanying diagram, were found to vary with the frequency of the alternating current sent through the cable. The lines shown in Fig. 1 represent the field resulting from using a frequency of 600 per second.

As regards the equipment of the airplane, this is simple in principle, consisting in mounting in a suitable place—for instance, on the tail of the machine three panels of insulated copper wire so placed as to be at right angles to each other, as shown in Fig. 2, where 1 is the longitudinal vertical panel, 2 the lateral horizontal panel and 3 the lateral vertical panel. These panels are connected to a telephone receiver, as in ordinary direction-finding wireless, via a commutator, so that the navigator can listen in on either of the three panels.

How the Device Operates

According to the position of the machine in relation to the cable, the intensity in each of the three panels varies or may even disappear. For instance, when the machine is flying parallel to the cable, the sound is a maximum in the longitudinal panel 1, and nil in the transverse vertical panel 3. As the machine diverges from the course parallel to the cable, the sound diminishes in the longitudinal panel, and increases in the lateral vertical panel, in which the sound becomes maximum when the machine is at right angles to the cable. The sound in the longitudinal panel then vanishes. The horizontal panel has the property that the sound in it vanishes when the machine is vertically above the cable.

It will thus be seen that if an airdrome has a cable running around it, the navigator of a machine can determine, even in a thick fog, the exact moment of crossing the cable, and by finding the height from the altimeter he can determine at what angle to glide into the airdrome in order to make a landing.

A special commutator enables the operator to put any two of the panels in series, and the information gained by so doing enables the exact position of the machine in relation to the cable to be determined. Thus, by placing in series the longitudinal and transverse vertical panels, the operator can determine whether the machine is inclined to right or left in relation to the cable. In order to determine whether the machine is approaching the cable from left to right, or from right to left, the longitudinal and horizontal panels are placed in series. Placing the transverse and the horizontal panels in series serves to indicate the vertical distance above the cable; in other words, it shows whether the cable is running up or down the side of a hill or mountain, or whether it is running horizontally over flat ground. By the use of the Loth cable, a machine can thus travel along over any sort of country, the navigator knowing his position, and knowing that he cannot accidentally run into a hill in the fog, as his receiver will warn him if he approaches too close to the cable. If this happens while the machine is flying horizontally, he knows that the

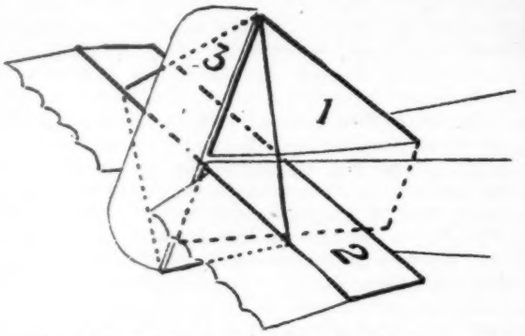


Fig. 2. Installation required on an airplane using the Loth guide cable

cable is running up the side of a hill, and if he is on a familiar route he will probably know which is the hill in question. Put in another way, the guide cable is both a direction wireless and a contour map of the route flown.

Some of the Difficulties Encountered

It goes without saying that the inventor had many difficulties to surmount, difficulties not directly connected with his system, but which had a considerable effect on its development. Thus it was found that the magnetos caused such a noise in the receiver as to drown, or nearly so, the sound from the wireless panels. To overcome this difficulty, it was necessary to explore the magnetic fields of the magnetos thoroughly, and this was consequently undertaken and brought to a successful conclusion. Mr. Loth has also found means of interrupting the sound from the wireless panels for the very short interval occupied while the spark plugs are giving off sparks. In point of fact, the receiving in the telephone ear piece is intermittent, but the intervals are so short as to be inaudible to the

human ear which hears the receiving as if it were continuous.

The practical results obtained with the Loth guide cable are briefly the following. With the horizontal panel (2) contact with the cable has been established from an altitude of 10,000 ft. With the two vertical panels contact has been attained from a height of about 8000 ft. At an altitude of somewhat over 6000 ft., the operator can hear on all three

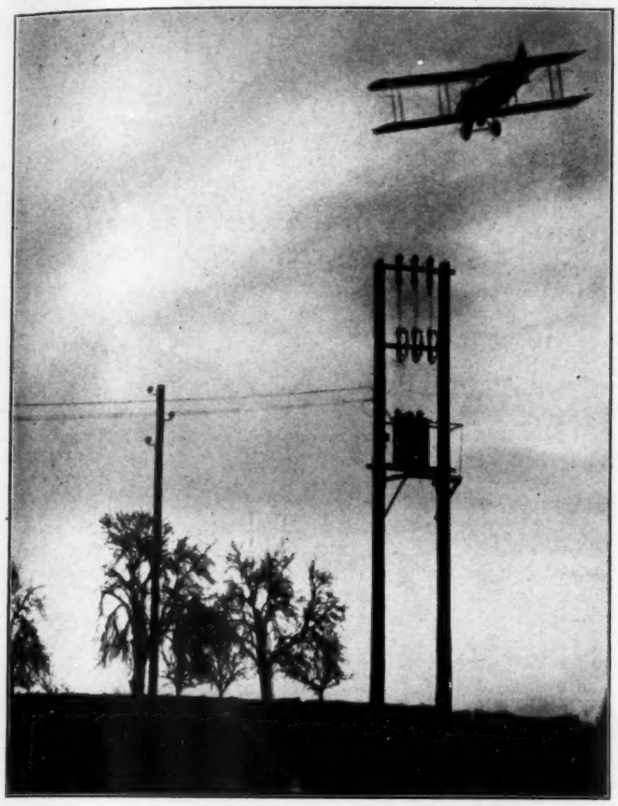


Fig. 3. French civil airplane experimenting with the Loth "guide cable" system

panels, and can begin to guide the machine without being much disturbed by the various noises on board. At lower altitudes the receiving becomes very loud. When flying at about 6500 ft., the cable can be "picked up" from a horizontal distance of approximately one mile. As the machine flies lower, what might be termed the "useful zone" increases in width, until at ground level the range is about 9 miles. These results were obtained with an experimental cable of 9500 ft. in length and having eight sharp angles in it. The longest straight length was less than 2000 ft. It is confidently expected that with a proper line, running more nearly straight, and of greater length, even better results will be obtained.

Louis Gaubert in France

Louis Gaubert, the veteran French flier who for the last two years has been engaged in passenger carrying and other civil aviation work at Roosevelt Field, Mineola, L. I., recently left for France in view of bringing some up to date French airplanes to America.

Mr. Gaubert's work in this country has so far been entirely carried on with Farman F40 machines, and while these craft have won an enviable reputation for their safety, which is mainly due to their remarkably low landing speed, they represent a type which may be considered antiquated today. Mr. Gaubert is understood to be treating with the syndicate of French aircraft constructors for the purpose of taking back to the United States a representative lot of French airplanes, among which there will be one of the latest Farman Goliath passenger carriers.

Air Service to Sell Standard Jl's

The Chief of Air Service announces that sealed proposals for the purchase of Standard J1 airplanes as scheduled below wi'l be received in the Material Disposal & Salvage Section, Office of the Chief of Air Service, Room 2624, Munitions Building, 20th & "B" St., N. W., Washington, D. C. until 3 p. m. (eastern time) Tuesday, May 2, 1922.

Location—Aviation General Supply Depot, Houston, Tex. Railway facilities:—Southern Pacific, Int. & Gt. Northern, Mo. Kans. & T., A. T. & S. F., Am. Rwy. Express.

Equipment—(1) 14 Standard J1 planes, new, minus engine.
(2) 15 Standard J1 planes, used, needing minor repairs, minus engines.
(3) 1 Standard J1 plane, used, needing general overhauling, minus engine.
These airplanes to inelude gasoline tank, hand pump and air gauge, but will not include instruments, accessories, spare parts nor tools.

Conditions of Sale—Bidders are requested to submit two proposals, one for the equipment "as is, where is" *the work of removing to be done by and at the expense of the purchasers;* the other, for the equipment *"as is"* f.o b. cars at point of storage, in which case a crating and handling charge of $25.00 per plane will be made, the Government reserving the right to accept whichever form of bid is considered most advantageous. Full opportunity for the physical inspection of this equipment can be had by applying to the Commanding Officer, Aviation General Supply Depot, Houston, Tex. Failure to inspect will not constitute a warrant for rejection of award. Description furnished and quantities on hand are based on best information available, but no guarantee on behalf of the Government is given.

The Air Service is also inviting sealed proposals for the purchase of a number of aircraft engines until 3 p. m. (eastern time) on Tuesday, May 9, 1922. The conditions and terms of sale are those stated above for the Standard J1 airplanes, and bids shou'd be addressed to the same office

This equipment includes: (1) 269 Lawrance A3 2-cylinder opposed air-cooled 28 hp. engines, 4 in. bore, 6 in. stroke, 1450 r.p.m., of which number 182 are of Class AA (new) and 87 of Class B;

(2) 16 Sturtevant Model 5A 8-cylinder V type water-cooled 140 hp. engines, 4 in. bore, 5½ in. stroke, 2000 r.p.m. No tools or instruments are on sale for some of these engines.

(3) 46 Thomas-Morse Model 8 8-cylinder V type water-cooled 135 hp. engines, 4 in. bore, 5½ in. stroke, 2000 r.p.m. Some of these engines have no exhaust or intake manifold, and some are without magneto or carburetor.

Chicago Air Board Honors Schroeder

Maj. R. W. Schroeder, Chief Aviation Engineer, Underwriters' Laboratories, has been elected an honorary member of the Air Board of Chicago. The Membership Committee of the Board recommended Major Schroeder's election with the preamble that "his character and accomplishments have been of great value to our Country in furthering aeronautical development."

While the more recent achievements of Major Schroeder as Chief Test Pilot of the Engineering Division, Air Service, are generally known, it is less common knowledge that his first interest in aeronautics dates back to 1908 when he built several gliders, and that he learned to fly on a Farman airplane in 1910 while acting as airplane mechanic for Otto Brodie, the Chicago flier.

Amundsen to Take Airplanes to Pole

Captain Roald Amundsen, the polar explorer who is soon to start on another venture into the Arctic Ocean, will use two airplanes in connection with his expedition. One of these, a JL6 metal monoplane, is to be used for the final dash to the North Pole, while the other machine, an Avro 504K, is to be employed as an advance scout of the ship for spotting icebergs, free water, etc.

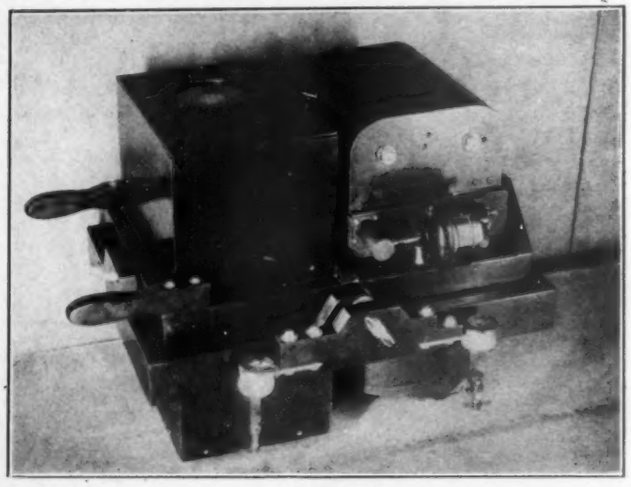
Practical Uses of Aerial Photography

Fairchild Camera Produces Remarkable Aerial Map of New York City -- Photogaphs Taken in 69 Minutes

A perfected aerial camera has just given a remarkable demonstration of its efficiency in the making of a photographic map of New York City. Municipal engineers say it will save many thousands of dollars and years of engineering work in effecting public improvements. The photographic map is more than 8 ft. long and 20 in. wide, and shows more than 32 square miles of the metropolis.

The Aerial Map of New York City

The apparatus which made this achievement possible is a big camera with several new devices invented by Sherman M. Fairchild, president of the Fairchild Aerial Camera Corp. of New York. His experiments during the last three years have



Fairchild aerial camera, mounted with a gyro, which was used in the making of the aerial map of New York City

been directed toward making the aerial camera developed in the war more accurate and economical. These points are essential in practical commercial photography, particularly for aerial maps of large size and showing countless details such as that of New York.

Inaccuracy has been the chief difficulty with various kinds of apparatus employed heretofore, and in overcoming them many technical problems were overcome by the Fairchild inventions. The mechanism and actual work of the new Fairchild camera were better than 99 per cent accurate in the aerial map of New York City—more than sufficient for all practical purposes, according to municipal officials and engineers.

The New York aerial map was taken from an airplane flying directly overhead, and is known technically as a mosaic. A film similar to the ordinary camera, though larger, was used and its exposure was regulated by means of an electric timing device gaged to the relative speed of the airplane from which the camera was operated.

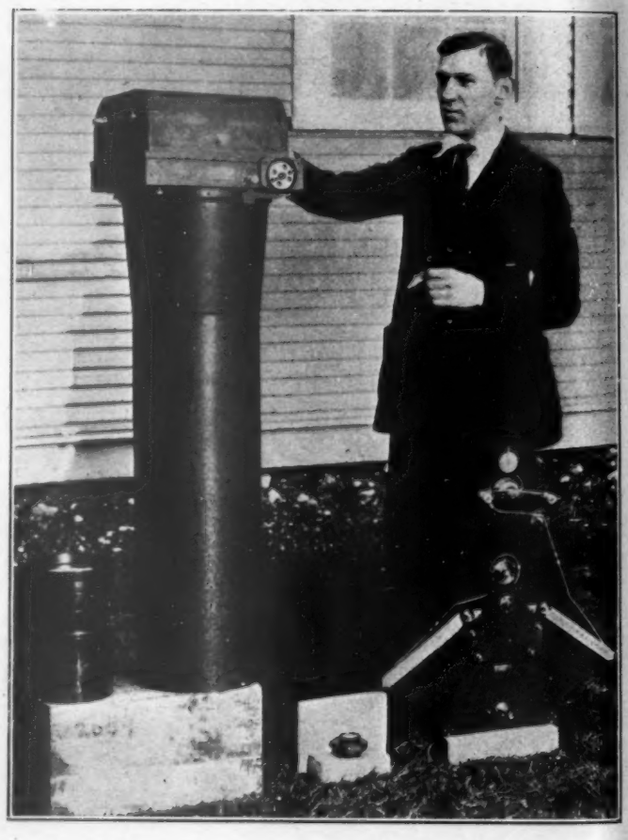
Plotting the city into rectangular sections of a scale so that each section could be photographed individually from the plane right over its exact center, the entire city from the Battery to Van Cortlandt Park was divided into 100 parts. Each of them was photographed. The hundred photographs were taken in a single flight of 69 min. As the plane passed over the center of each rectangular section there was an automatic click of the camera, and the film automatically rolled into position for another exposure a few seconds later. When the sections had all been "snapped," there were 100 photographs, all together totalling an area of approximately 32 square miles. They were then fitted together and mounted on cardboard to form the aerial mosaic.

Speaking of this map, Commissioner Joseph Johnson of the Department of Public Works said that he had intended motoring out to inspect two proposed operations but that with the map on his desk he could attend to it there in a few moments. Nelson P. Lewis of the Russell Sage Foundation, a noted city planner, believes that in the future the aerial map will be used in all city planning operations as it will enable them to plot the most direct routes, locate obstacles, determine the number of overheads and short cuts, and lead traffic up through the city and out into the suburbs.

The mosaic, or vertical view requires an equality of detail throughout and over large areas. In oblique views the detail is lost in the background, for it diminishes with great rapidity and, due to the angle at which the picture is taken, will not permit of overlapping or joining consecutive areas. On the other hand the angles of the vertical picture are symmetrical and permit the overlapping of a large number of photographs, thereby covering great areas and maintaining equality in detail. That is the mosaic, or aerial map, for which the Fairchild camera is peculiarly adapted. It secures accuracy over unlimited areas.

The Improved Fairchild Camera

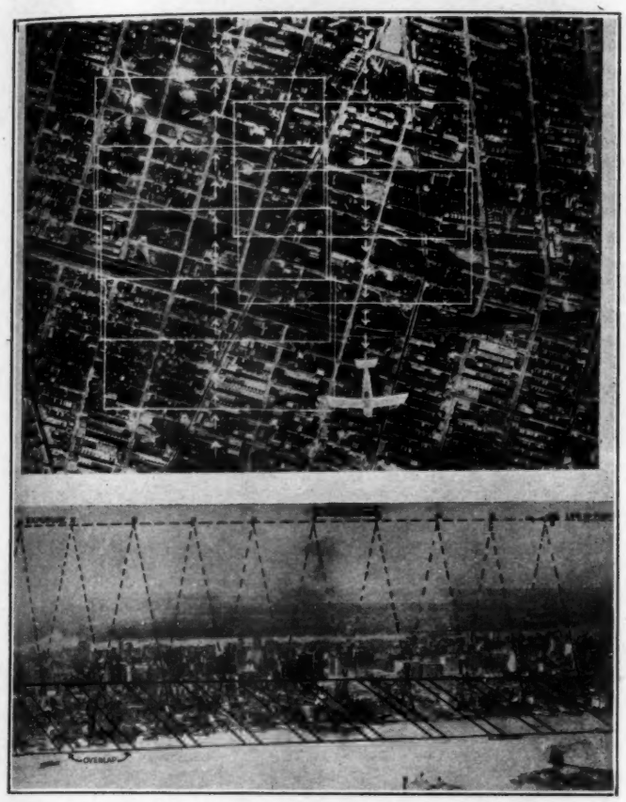
To secure this accuracy, Fairchild developed what is known as the between-the-lens shutter which actually saves the brief instant which other shutters spend traversing the plate during the exposure. This instant would matter little in ordinary photography, but in mapping, or making vertical shots, the speed of the airplane would cause a distortion in the map.



On the left is the largest aerial camera in the world, which will take photographs from an altitude of 35,000 ft.; on the right is a new three-lens camera designed by Major Bagley (standing)

The focal plane shutter has been used in the past and serves its purpose for oblique views which do not require accuracy.

The between-the-lens shutter exposes the entire plate in 1/150th sec. and it can be seen that the plane has traveled no distance in that instant. The whole plate is exposed at once, instantly, and from the same position, while the focal plane shutter, though its speed may be rated 1/150th sec. actually exposes part of the plate only in this time. That part or portion exposed is only the actual width of the slit in the shutter curtain but this distance must be multiplied by the actual length of the plate—and in reality the time taken for the exposure is reduced to approximately 1/10 sec. during which time the plane has traveled approximately 16 ft. All of which is to say that the picture is taken from two viewpoints 16 ft. apart at its ends. This causes distortion which makes accurate joining of pictures extremely difficult and often times impossible.



Diagrams showing how the aerial map of New York City was made

The new Fairchild aerial camera is equipped with the automatic interval device for timing exposures according to the speed of the airplane, and with the automatic spacing device for conserving the film, or in other words, getting more exposures on one roll of film.

With the perfection of the Fairchild gyrostabilizer, which permits the airplane to swing at an angle while the camera remains stationary and insensible to the vibrations of wind and motor, the inventor feels confident that photographs can be taken in the absolute vertical, thereby affording a base line from which all other angles may be computed.

Some Instances of Practical Use

Actual uses to which the new Fairchild camera has already been put would seem to illustrate the soundness and practicability of the inventor's conclusions. During the Carpentier-Dempsey fight in Jersey City aerial photographers experimenting with the Fairchild camera remained at an altitude of 2000 ft., thereby obeying the law. The weather was anything but propitious for photography, as it rained at intervals, mist shrouded the earth and blotted out all details to the human eye. But the eye of the camera nearly a half mile up there over the great arena caught the complete details, despite the low-flying limit imposed by law, the rain, weak light, haze and heavy mist.

The aviators photographed the preliminaries of the championship fight, took them back to Manhattan in their flying boat, landed, hurred into a newspaper office where the films were developed and the prints were actually mailed to all newspapers throughout the country before the Bout had been decided. After delivering their negatives, the camera men again flew back over the arena in Jersey City and snapped the big fight from the air, remaining until the crowd started to leave. Again they crossed the Hudson River and taking the plates to the newspaper office succeeded in developing them into prints before the arrival of the photographers who had covered the fight from the ringside. It was a striking illustration of the speed of the airplane and the practical and speedy efficiency of the Fairchild camera and auxiliary apparatus.

Locating a Broken Pipe Line

Then there is the case of the old frigate, Granite State, which burned to the water and sank at her dock at 98th Street and North River. The origin of the fire was a mystery until officials scanning the aerial photographs made of the fire and immediately preceding it, discovered the presence of foreign substance floating on the surface of the water along that part of the waterfront. It proved to be oil. An investigation resulted in tracing the oil to a broken pipe line on the river bottom.

There are recorded cases where companies have been able to influence the award of more than the customary amount of insurance after a fire, flood or other property damage, chiefly because they presented aerial photographs proving the extent of the damage sustained, back of the fire lines as well as the actual damage done to buildings. It happened in the case of the Erie Railroad pier fire in Jersey City. The piers burned. The damage to them was easily shown and proved by the railroad company. But when they made aerial views showing the paralyzed state of traffic in their yards and on all their trackage, it was not difficult to convince the insurance adjusters that material damage amounted to more than the burning of the piers.

The taking of aerial views for advertising purposes forms another important branch of commercial aerial photography.

The owner of a famous nursery on the Hudson was able to secure in one photograph, a complete portrayal of all the species and foliage, actual number of the 350,000 trees and their height. It saved sending an agent on a tour of the premises to sell prospective purchasers. All the selling, practically, is now accomplished in the office hundreds of yards from the rolling acres across which the staff formerly trudged many weary miles daily. They now sell in the front office, or by canvassing with their photographic exhibits or through the medium of catalogues containing aerial views artistically arranged and printed.

Arthur S. Tuttle, Chief Engineer for the New York Board of Estimate & Apportionment, found the value of aerial surveys limitless both from the time-saving and economical points of view. He ordered a mosaic map from Fairchild in connection with the Narrows Tunnel project and marginal railway plan for the development of the New York Port.

Surveying Railroad Territory

The survey made from the air covered the proposed marginal railway territory, freight classifying yards and belt-line road, connecting all the railroads terminating in New York. His principal objects were to put the plan most comprehensively before the railroad and other executives in the quickest possible period of time. One of the most interesting facts brought out was that the aerial map revealed the location of waterfront property on Staten Island, along Arthur Kill, close to New York, yet undeveloped, while on the opposite shore, in Jersey, the aerial view brought out distinctly the active industrial conditions there made possible by excellent rail facilities.

In showing his aerial map to railway executives and engineers, Mr. Tuttle was able to demonstrate the feasibility of his

railway plan in tying up transport with the new Staten Island piers. Also, he was able to make tentative charts of the routes to be taken, without a ground survey and months spent in securing information from the ground.

Hotels have used aerial photographs in their advertising, showing patrons how centrally located they are in respect to other districts, such as the railroads, theatrical and shopping centers. Ports, Chambers of Commerce and suburban towns have benefitted to remarkable extent by aerial advertising. The American Red Cross recently exhibited aerial views of New York's East Side showing the lack of playgrounds and the congested tenement district.

This accurate portrayal of built up sections and the wasted or uninhabited districts are matters for industrial and economic experts to consider. Not long ago a committee was appointed to find out the reasons why one side of a small stream in New York State was built up with factories and homes while the other side had remained barren. It seemed a simple assignment, yet none of the reasons advanced was proof against argument, until an aerial map of the entire territory was made. There it showed conclusively the trend of building and occupation had followed the railroad on that side of the stream. On the other there had been no railroad to provide the transport necessary to progressive industrial and civic development.

Saving Time and Money

By far one of the main considerations of aerial photography is its saving in time and money. Securing a clear detailed vision, permanently, of areas under development, or plots damaged by fire, flood or storm, taking out timber or protecting that timber from forest fires, swamp drainage, excavating or municipal improvement, is economical. The following case in point may serve to illustrate this economy.

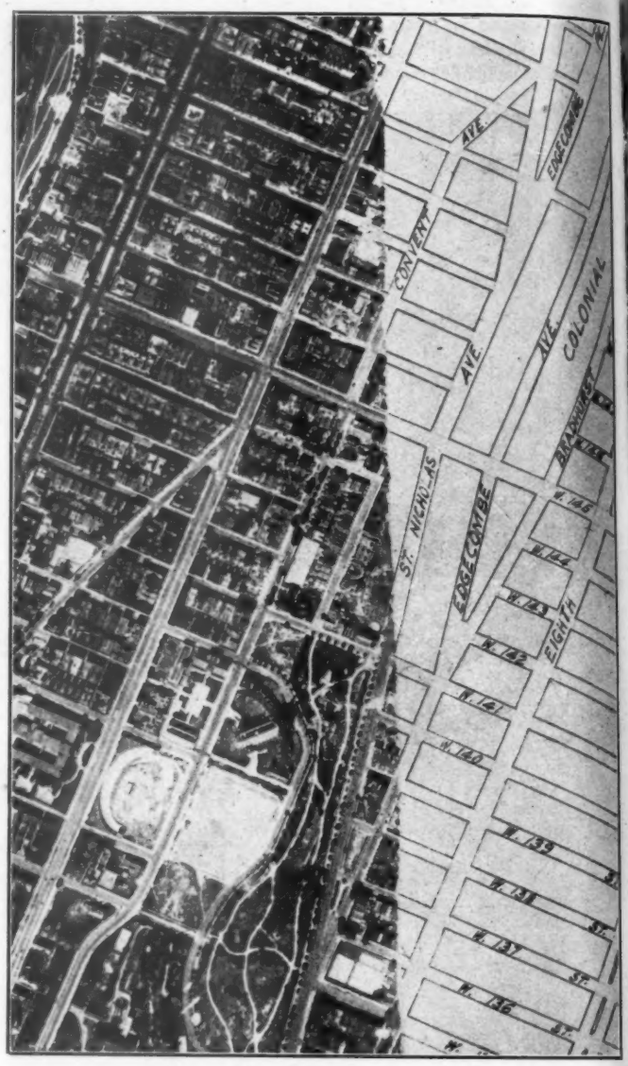
A Fairchild camera man left Curtiss Field, at Garden City, Long Island, N. Y., in a Curtiss Standard plane. Over Port Washington he photographed the entire village, then to Mamaroneck, N. Y., where Miss Merrill's School for Girls was photographed over White Plains, completely photographed, also Gedney Farms. On to North White Plains where a view was made of the town then to Kensico Dam, so large that ground photographers cannot get a complete view of it. The aerial picture gave it all including the surrounding hills and watersheds. On to Croton Dam, he duplicated the work there. Over to Valeria Homes, where photos were made for engineering data and advertising displays, showing the plans for new buildings and buildings operations already under way; there also were taken views of the infested mosquito swamps and drainage system, giving in detail the enormous amount of work done, which incidentally gave a reason for the expenditure of the appropriations. The plane then went on to Peekskill, where the Fleishman Yeast Plant was taken; on down the Hudson Valley where a school was photographed also John D. Rockefeller's estate, then the Sleepy Hollow Golf Course, Spuyten Duyvel, the United Electric Light & Power Co.'s Plant, the Bronx Concourse and finally the new electric plant on 133rd Street in the Bronx. In all 84 aerial photographs were taken during the flight—80 per cent of which were perfect.

Other Uses of Aerial Photograph

The uses of aerial photography have been developed into still another branch of the business. It has enabled to make stocking prints, that is, saving prints of growing sections of city or country. By continuously taking photographs, say at regular intervals, one has a detailed history much easier to look at than musty diaries or old forgotten town hall records. This thought has penetrated the real estate business and offered it vast possibilities. The possibilities are as effective as the strength of the camera itself which, due to the recent improvements, is now able to penetrate the thick haze which hangs over New York City from high altitudes to secure detail.

There is another use for the aerial camera—the line map. The photographic mosaic, or aerial map, can be easily made into a line map by eliminating non-essential details, and it is being done wherever occasion requires.

Within the last few days the Fairchild Aerial Camera Corp. has completed arrangements with the Laurentide Air Service operating for the Laurentide Co. of Grand'Mère, Quebec, Canada, to plot and develop aerial photographs of 1500 square miles of their timber holdings in the North Country. From the aerial photographs, the foresters can count the number and tell the approximate size of the various kinds of trees. They can see burnt over, blown down, and cut over areas, and they can do their lumber cruising in the office, quicker and at less ex-



How a line map is made from an aerial photograph: the contours having been outlined, the print is bleached in a chemical bath

pense than by the old method of sending timber cruising parties through the forest.

Future of Aerial Photography

Aerial photography will increase in use and importance until it is an everyday part of routine business just as ordinary photography is employed by every business and industrial institution today. This development will not only progress with the popularity of aviation, but it will also constitute one of the principal functions of the airplane. Not only will aerial mapping and other kinds of aerial photography come into general use among civilians, but also with governments. If it were to be used only for pioneer work, such as the preliminary surveying of the vast uncharted areas here, throughout the North American Continent, in South and Central America, the aerial camera would have steady and continuous employment for a score of years. Aviation authorities credit it with being one of the most progressive and profitable branches of aeronautics today and one which will develop with considerable rapidity.

"Who's Who in American Aeronautics"

(Copyright, 1921, by The Gardner, Moffat Co., Inc.)

The biographical sketches of men who are prominent in American Aeronautics are printed periodically in AVIATION. The first series will be shortly published in a more durable form, and revised issues will be published semi-annually to take care of the frequent changes in station of Army and Navy officers, and such other changes as may occur. As errors and omissions are liable to occur in a compilation of this character, interested parties are requested to notify "Who's Who" Editor of the necessary corrections so the record may be kept up to date.

Yantis Halbert Taylor

TAYLOR, YANTIS HALBERT, 2nd Lt., Texas National Guard; born, Bartlett, Tex., July 29, 1898; son of M. W. Taylor and Rosa (Lee) Taylor.

Educated: Belton High School; Peacock Military College.

Professional: Contracting business before war.

Aeronautical Activities: Graduated S.M.A., Austin, Tex., Aug. 1918; training at Kelly Field, March 1919; since that time doing commercial flying and advertising for newspaper; commissioned 2nd Lieut. in Texas National Guard Air Service on Jan. 19, 1922 and since that time has been employed in locating stills in East Texas.

Flying Rating: Reserve Military Aviator, March 1919.

War Service: Air Service, Jan. 1918 to March 1919.

Member: Aero Club of America.

Present Occupation: 2nd Lt. Texas National Guard Air Service.

Address: Belton, Tex.

John Whitten McKeon

McKEON, JOHN WHITTEN, Traffic Clerk; born, Long Island City, N. Y., Aug. 1, 1895; son of Patrick Henry McKeon and Ophelia Dyer McKeon.

Educated: Public School No. 7, N. Y.; Bryant High School; A.B., Columbia, 1917.

Professional: Troy Laundry Machinery Co., Oct. 1919 to date.

Aeronautical Activities: U.S.S.M.A., Cornell Aug. 13, to Oct. 6, 1917; 2nd A.I.C., Tours, France, March 17, 1918 to Aug. 15, 1917; Instructor 7th A.I.C., Clermont-Ferrand, Sept. 8, 1918 to Oct. 1, 1918; 166 Aero Squadron, Oct. 9, 1918 to April 17, 1919.

Flying Rating: Aerial Observor (Bombardment).

War Service: July 18, 1917 to June 9, 1919.

Honors: Cited in G. O. No. 29, Par. 14, Office of First Army Air Service Commander, A.E.F., Nov. 21, 1918.

Member: American Legion; Aero Club of America.

Present Occupation: Traffic Clerk.

Address: 133 Centre Street, New York City; home, 112 Fulton Ave., Astoria, L. I., N. Y.

George Washington Vest

VEST, GEORGE WASHINGTON, Sr. Law Student and Accountant; born, Buckner, Mo., Aug. 26, 1894; son of Henry B. Vest and Jennie L. Vest.

Educated: Public schools of Buckner, Mo.; Highland Park College, 1914-1916; Drake University, 1919-1921.

Aeronautical Activities: Graduated School Military Aeronautics, University of Texas; Park Field School of Aviation, Millington, Tenn.; Kelly Field.

Flying Rating: Reserve Military Aviator; Pursuit Pilot.

War Service: Army, Dec. 1917 to March 1919.

Member: Aero Club of America.

Present Occupation: Sr. Law Student and Accountant, Drake University.

Address: 7th University St.; home, 1204- 24th St., DesMoines, Iowa.

William Cameron McKenzie

McKENZIE, WILLIAM CAMERON, Stock Raiser; born, Florence, S. C., June 23, 1894; son of Joseph Saunders McKenzie and Leila Pettigmo McKenzie.

Educated: Davidson College (2 yr.)

Professional: Farming and Stock raising.

Aeronautical Activities: M.I.T. naval ground school, March 25, 1918; Naval Air Station, Key West, Fla., June 12, 1918; Naval Air Station, Miami, Fla., July 1918; commissioned Ensign at Pensacola, Sept. 18, 1918; Naval Air Station, Hampton Roads, Va. until Jan. 9, 1919.

Flying Rating: Naval Aviator, No. 1263.

War Service: April 6, 1917 to Jan. 9, 1919.

Present Occupation: Stock Raising.

Address: Bannockburn, S. C.

Charles C. Witmer

WITMER, CHARLES C., Commercial Aviator; born, Sandusky, Ohio, June 6, 1882; son of Winfield Scott Witmer and Elnora (Ireland) Witmer; married, Lydia Peltzie, July 1915.

Professional: Railway construction, 1898-1903; prospecting and mining, 1903-1910.

Aeronautical Activities: Experimental work with Glenn H. Curtiss at Hammondsport and San Diego, Calif., 1910; learned to fly 1911; exhibition flying in twenty states, 1911 and 1912; demonstrated and delivered Curtiss products in Russia, Germany, France and Austria, 1912-1913; flying for Harold F. McCormick, 1913; Russia, 1914-1916; U. S. Navy R.F. March 1917 as Lieutenant; promoted to Lt. Comdr. 1918; Superintendent, Construction of Aircraft, 1st Naval District, later Superintendent, Construction of Aircraft and Inspection, Akron, Ohio, 1920 Airship Manufacturing Co. of America, to date.

Flying Rating: Aero Club of California License No. 4; Aero Club of America License No. 52.

War Service: 1917, Lieutenant, U.S.N.R.F.; 1918, Lt. Comdr., U.S.N.R.F.; Superintendent Constructor of Aircraft.

Member: Aero Club of America.

Present Occupation: Airship Manufacturing Co. of America.

Address: Hammondsport, N. Y.

Kenneth Russell Unger

UNGER, KENNETH RUSSELL, Pilot, Air Mail Service; born, Newark, N. J., April 19, 1898; son of Eugene Unger and A. W. (Osmun) Unger; married, Lois Whittaker, May 27, 1919.

Educated: Montclair Academy.

Professional: Army, 1917-1919; fruit buyer, western canning Company, 1919-1920; commercial aviation, California, Sept. 1920, Air Mail Service.

Aeronautical Activities: University Toronto Ground School, June 1917; Fort Worth, Tex. Instructor, Nov. 1917; France, April 1918 to end of war with 210th Squadron, R.A.F.; 1920, commercial aviation; Sept. 1920, Air Mail Service; (First pilot to carry passengers in and out of Yosemite National Park, Calif.)

Flying Rating: 1st Lieut. R.A.F. Pilot; Aero Club of America Certificate No. 1356.

War Service: Turned down in U. S. and enlisted in R.A.F., June 1917 to April 1919.

War Honors: Distinguished Flying Cross, Nov. 17, 1918; officially credited with destruction of—ten enemy planes and one captive observation balloon.

Member: Air Mail Pilots of America.

Present Occupation: Pilot, Air Mail Service.

Address: Air Mail Service; home, Belvedere Apts., Salt Lake City, Utah.

George Sutherland

SUTHERLAND, GEORGE, Electrical Engineer; born, Fort Plain, N. Y., Nov. 20, 1884; son of Lewis F. Sutherland and Helen Harriett Sutherland; married, Ruth Trench, Nov. 16, 1920.

Educated: Fort Plain High School; A.B. 1907, Yale University; B.S. in Electrical Engineering, 1916, Mass. Inst. of Tech.; B.S. E.E. 1916, Harvard University.

Professional: Assistant Engineer and Valuation Engineer of N.Y.N.H. & H. Railroad; Engineer in Electrical Engineering Division of Stone & Webster, Inc.; Engineer in Electrical Engineering Department, United Electric Light & Power Co. to date.

Aeronautical Activities: Ohio State University Ground School, 1917; Cadet, Tours, France, Nov. 1917 to May 1918; Instructor in flying, Tours, France; Observation Pilot, Artillery School, Saumun, France; student flier, 3rd A.I.C., Issoudun, France, 1918.

Flying Rating: Reserve Military Aviator, April 1918.

War Service: Enlisted July 1917 and discharged Sept. 1919.

Member: Yale Club of New York; American Institute of Electrical Engineers; N.E.L.A.

Present Occupation: Electrical Engineer.

Address: 130 East 15th St., New York City; home, 590 East 21st St., Brooklyn, N. Y.

Carl K. Wollam

WOLLAM, CARL K., Pilot; born, St. Clair, Ohio, Feb. 10, 1893; son of S. S. Wollam and Etta Wollam; married, Corream McShane, June 18, 1913.

Educated: Public schools of East Liverpool, Ohio.

Professional: Aeronautics, 1911 to 1912; 1912 to 1913, automobile and electric business; 1913 to date, aeronautics.

Aeronautical Activities: Experimental airplanes, 1911 to 1912, Curtiss Aeroplane Co. 1915; in charge of assembly airships at various naval air stations and flying instructor in balloons, Wingfoot Lake Naval Air Station, 1917 to 1920; Chief Pilot, Goodyear Tire & Rubber Co. of California and Marshal Neilan Prod. from 1920 to 1921.

Flying Rating: Dirigible Pilot No. 36; Free Balloon Pilot; Kite Balloon and Aeroplane Pilot.

War Service: Industrial Aircraft Service during the war.

Present Occupation: Sales.

Address: Goodyear Tire & Rubber Co:; home, 322 W. Market St., Akron, Ohio.

Nicholas Carter Wright

WRIGHT, NICHOLAS CARTER, Automobile Business; born, Surry Court House, Va., Aug. 4, 1894; son of Nicholas C. Wright and Mary (Land) Wright.

Educated: Public schools; Virginia Polytechnic Institute, 1913-1915, Electric Engineering.

Professional: Automobile salesman from 1915 to 1916; General Manager of Oldsmobile Co. of Norfolk, Va., 1917 and 1918; Army Air Service, 1918 to 1919; Pilot for Danville Aircraft Corp., Aug., 1919 to March 1920; Sales Manager for H. H. Johnson at present time.

Aeronautical Activities: Ground School, March 1918; Barron Field, Tex:, Aug. 1919 to March 1920; exhibition work and passenger flying in the south; operating flying boat in and around Norfolk, Va.

Flying Rating: Reserve Military Aviator.

War Service: Army, A.S.S.R.C., Dec. 1917 to Jan. 1919.

Member: Aero Club of America.

Present Occupation: Sales Manager, H. H. Johnson, Distributor Chandler Cars for State of Virginia, also operating flying boat.

Address: 1414 Granby St., Norfolk, Va.; home, 8th St., Willoughby Beach, Va.

George Mason Nicholson

NICHOLSON, GEORGE MASON, Accountant; born, Zuni, Va., May 31, 1895; son of John Young Nicholson and Helen Minerva Nicholson; married, Elizabeth Caroline Duckwall, Jan. 8, 1920.

Educated: William and Mary College, Williamsburg, Va.

Professional: Railroad employee, 1913-1917; accountant since the war.

Aeronautical Activities: March-April 1918, Ground School, University of Texas; flying Instructor at Dayton, Ohio; Instructor and Student at West Point, Miss., Mineola, N. Y. and San Diego, Calif., until Jan. 1919.

War Service: May 1917 to Jan. 1919.

Member: Aero Club of America; Military Order of the World War.

Present Occupation: Accountant.

Address: 202 Law Bldg.; home, 4714 Colonial Ave., Norfolk, Va.

Emory D. Stanley

STANLEY, EMORY D., Lt. Comdr, U. S. Navy; born, Hooper, Nebr., Nov. 16, 1881; son of C. C. Stanley and Kate (Bosler) Stanley; married, Eva Cooper, Dec. 19, 1908.

Educated: South Omaha High School; A.B. 1904, University of Nebraska.

Professional: Armour & Co., 1904-1905; U. S. Navy, Supply Corps, 1905-1921.

Aeronautical Activities: Member, Navy Aviation Conference, 1920-1921.

War Service: World War, Navy.

Member: Racquet Club of Washington.

Present Occupation: Lt. Comdr., U. S. Navy.

Address: Navy Department, Washington, D. C.

Notices to Aviators

Issued by Hydrographic Office, U. S. Navy

Landing fields—Information.—The following information concerning landing fields in Arizona has been received from the office of the Director of Air Service, War Department:

Arizona

Bisbee.—Field owned by the Warren District Country Club; latitude 31° 25′ N., longitude 109° 53′ W.

Field 1,000 by 800 ft., adjoining the city on the north.

Prevailing wind, east; altitude, 5,550 ft.; condition, good.

Gas and oil can be purchased in the city.

Clifton, Clifton Field.—Owned by the United States Government; latitude 33° 04′ N., longitude 109° 02′ W.

Field 3,600 ft. square, with T in center, located seven miles south of city.

Prevailing wind, southeast; altitude, 4,000 ft.; condition, good.

Gas and oil can be purchased in the city.

Fort Thomas.—Latitude 33° 02′ N., longitude 110° 00′ W.

Field 1,000 ft. square, located 2 miles south of city.

Prevailing wind, south; altitude, 1,750 ft.; condition, good.

Gas and oil can be purchased in the city.

Kingman, Kingman Field.—Owned by Mohave County; latitude 35° 12′ N., longitude 114° 05′ W.

Field 2,000 ft. square, with T in center, located 2½ miles northeast of city.

Prevailing wind, north and south; altitude, 3,800 ft.; condition, good.

Gas and oil can be purchased in the city.

Nadaburg.—Field owned by W. H. Griffin; latitude 33° 46′ N., 112° 30′ W.

Field 2,640 by 1,200 ft.; located 2 miles north of city. City on south; railroad on north.

Prevailing wind, west; altitude, 1,677 ft.; condition, good.

Gas and oil can be purchased in the city.

Nogales, Fort Nogales.— Owned by the Government; latitude 31° 20′ N., 110° 55′ W.

Field 3,500 by 1,500 ft. located northwest of city; United States Aviation Camp.

Prevailing wind, southwest; altitude, 3,700 ft.; condition, good.

Field has all accomodations.

Peach Springs.—Latitude 35° 32′ N., longitude 113° 28′ W.

Field 2,000 by 500 ft., adjoining city on north.

Prevailing wind; west; altitude, 4,800 ft.; condition, good.

Gas and oil can be purchased in the city.

Phoenix, State Fairgrounds.—Owned by the State; latitude 33° 27′ N., longitude 112° 05′ W.

Field 1,700 by 480 ft., with cross in center, located 1½ miles northwest of city.

Prevailing wind, southwest; altitude, 1,055 ft.; condition, good.

Gas and oil can be purchased on the field.

St. Johns.—Field owned by the city; latitude 34° 30′ N., longitude 109° 22′ W.

Field 2640 ft. square, located ¼ mile south of city. Race track and cemetery on east.

Prevailing wind, south; altitude, 5,600 ft.; condition good.

Gas and oil can be purchased in the city.

Springerville, Apache Field.—Latitude 34° 08′ N., longitude 109° 18′ W.

Field 2,000 by 1,800 ft., located ½ mile east of city.

Prevaling wind, northeast; altitude 6,900 ft.; condition, good.

Gas and oil can be purchased in the city.

Tucson, Municipal landing field.— Owned by the city; latitude 32° 14′ N., longitude 110° 57′ W.

Field 2,000 by 1,800 ft., located one-half mile south of city; hangars and cement circle.

Prevailing wind, southwest; altitude, 2,400 ft.; condition, good.

Field has all accommodations.

Yuma.—Latitude 32° 42′ N., longitude 114° 36′ W.

Field, 1,800 by 600 ft., located 1½ miles west of city. Has circle with T in center.

Prevailing wind, southwest; altitude, 2,400 feet; condition good.

Field has all accommodations.

—*(N.A. 1, 1922.)*

California

Landing fields—Information.—The following information concerning landing fields in California has been received from the office of the Director of Air Service, War Department:

Alameda.—Field 4,000 by 2,000 ft; latitude 37° 45′ N., longitude 122° 15′ W.

Field has hangar with wind indicator; shipyards on west, car barn on north, estuary on northwest; Bethlehem Steel Mills next to estuary.

Prevailing wind, west; altitude, 15 ft.

This field is in excellent condition and has all accomodations with direct car service to the city.

Alturas, Alturas Field.—Modoc County; latitude 41° 30′ N., longitude 120° 33′ W.

This field is 1,200 by 900 ft., located 2 blocks westward of the city and marked by a T in the center.

Altitude, 4,500 ft.; prevailing wind, southwest.

There is some sagebrush on the field, but this will not injure a plane.

This is a sub-base for the Army forest patrol and provides all accomodations.

The courthouse, with dome, stands in the center of the city.

Angels Camp.— Latitude 38° 05′ N., longitude 120° 30′ W.

This field is 1,200 ft. square, owned by the municipal race track association, and located on the southern edge of the city in the center of the race track; track surrounded by a fence.

Prevailing wind, southwest.

This field is a four-way field and is in good condition, but planes should land as near the east side as possible.

Gas and oil can be purchased in the city.

Arroyo Grande.—Latitude 35° 08′ N., longitude 120° 36′ W.

This field is 2,000 by 1,000 ft. owned by J. F. Becket and located 1½ miles west of the city and 1 mile east of Pismo Lake, with a public highway on the north.

Prevailing wind, west; condition, good; altitude, 150 ft.

Gas and oil can be purchased in the city.

Auburn, Auburn Field.— Owned by the city of Auburn; latitude 38° 53′ N., longitude 121° 05′ W.

This field is 1,100 by 800 ft., located 2 blocks west of the city, in the center of the race track; city on east; race track surrounding field; Standard Oil Co.'s plant 500 ft. northwest.

Prevailing wind, north and south; altitude, 1,360 ft.

The field slopes slightly toward the west and trees constitute an obstruction on the south.

Gas and oil can be purchased at the Standard Oil Co.'s plant.

Bakersfield, Bakersfield Field—Owned by the city; latitude 35° 23′ N., longitude 119° 00′ W.

This field is 1,500 by 750 ft., located 4 miles east of the city, eastward of Standard Oil Co.'s derricks.

Prevailing wind, east; altitude, 70 ft.; condition, good.

Gas and oil can be purchased from the Standard Oil Co.'s plant near by.

Barstow Municipal landing field.—Owned by the city of Barstow and located 1 mile north of the city; latitude 35° 05′ N., longitude 117° 04′ W.

This field is 1,800 by 600 ft., marked by number "130" and *white arrow* in the center of field.

Prevailing wind, southwest; altitude, 2,300 ft.

There is some sagebrush but this will not injure a plane.

Gas and oil can be purchased in the city. Auto service to city.

Bay Point.—Latitude 38° 03′ N., longitude 122° 00′ W.

This field is 4,000 by 1,000 ft., located ½ mile south of city and owned by Walter Varney. It has a hangar, shipyard and factory on the east.

Prevailing wind, northeast; condition, good.

With all accommodations, including street car service to the city.

Bodie, Booker Flat.— Owned by J. S. Cain; latitude 38° 14′ N., longitude 119° 00′ W.

This field is 2,000 ft. square and adjoins the city on the west; city on east; mines ½ mile southeast of field.

Prevailing wind, west; altitude, 8,300 ft.

Some sagebrush; may cause trouble.

Gas and oil can be purchased in the city.

Bridgeport, Bryant Field— Owned by the city of Bridgeport; latitude 38° 17′ N., longitude 119° 16′ W.

This field is 2000 by 750 ft., located ¼ mile northeast of the city, with three white houses and large shed on the east.

Prevailing wind, southwest; altitude, 6,465 ft.

This is a four-way field, and slopes slightly to the north.

Gas and oil can be purchased in the city.

Burbank, Brands Field,—Owned by L. A. Brand; latitude 34° 10′ N., 118° 20′ W.

This field is 1,800 by 600 ft., located 2 miles east of the city; marked by T in the center, with hangar at the south end and orange orchard at the north end.

Prevailing wind, east; altitude, 800 ft.

In good condition and used continually.

All accommodations, including auto service to the city.

Calipatria.—Latitude 33° 05′ N., longitude 115° 30′ W.

This field is 2,200 ft. square and adjoins the city on the east. On the west of the field stand a large oil tank and a cotton gin.

Prevailing wind, north and south; altitude, 15 ft.; condition, good.

Gas and oil can be purchased in the city.

Camp Kearney.—Owned by the United States Government; latitude 32° 56° N., 117° 10′ W.

Field in a United States Infantry camp, 2,000 ft. square, 15 miles northward of San Diego.

Prevailing wind, north and south; altitude, 200 ft.; condition, good.

The field has all accommodations.

Chico, Chico municipal aviation field.—Owned by Thomasson Bros.; latitude 39° 42′ N., longitude 121° 48′ W.

This field is 1,500 by 9,000 ft. located one-half mile south of the city marked by a large C in the center of the field, with a T in the center of the C.

Prevailing wind, north and south; altitude, 95 ft.; condition, good.

Two oak trees in the center of the field.

Gas and oil can be purchased in the city.

Chowchilla.—Field owned by city; latitude 37° 28′ N., longitude 119° 50′ W.

Field 2,000 by 600 ft., located one-fourth mile northward of city, adjoining highway; T in center of field.

Prevailing wind, north; altitude, 150 ft.; condition, good.

This field is a fueling station for the Army forest patrol, and has all accommodations.

Colusa.—Field owned by Messrs. Tubbs and Tuttle; latitude 39° 12′ N., longitude 122° 00′ W.

This field is 1,600 ft. square and adjoins the city on the west.

Prevailing wind, south; altitude, 60 ft.; condition, good.

This is a four way field.

Gas and oil can be purchased in the city.

Corning.—Field owned by the Corning Chamber of Commerce; latitude 39° 55′ N., 122° 10′ W.

Field 2,000 ft. square, with runway 2,000 ft. by 600 ft., located one-half mile northwest of city, marked by T in center. City on south; high school building on east.

Prevailing wind, north and south; altitude, 3,500 ft.; condition good.

This field is a sub-base for the Army forest patrol and is provided with all accommodations.

Corona.—Latitude 33° 52′ N., longitude 117° 33′ W.

This field is 1,200 by 1,000 ft., located 5 miles north of the city.

Prevailing wind, east and west; altitude, 500 ft., condition, rolling, *full of holes, with high grass.*

Gas and oil can be purchased in the city.

Cotati.—This field is owned by the North Bay Counties Speedway Association and adjoins the city on the north; latitude 38° 20′ N., longitude 122° 45′ W.

The field is 2,400 by 1,200 ft., located in the center of the race track and marked by a T in the center of the field.

Prevailing wind, south; altitude, 46 ft.; condition good.

Gas and oil can be purchased in the city.

Crescent City, Crescent City Beach.—Owned by the Del Norte Hotel; latitude 41° 43′ N., 124° 13′ W.

This field is 2,640 by 750 ft., located on the beach between the city and the ocean.

Prevailing wind, north in summer, south in winter; best for landing at low tide.

Two-way field; two blocks west of gas and oil station.

Daggett.—Owned by the United States Government; latitude 34° 52′ N., longitude 116° 52′ W.

Field 2,200 ft. square, located 1 mile northeast of city; has city on southwest, desert and several dry lakes on north.

Prevailing wind, west; altitude 2.200 ft.

Field is open desert; four-way field.

Gas and oil can be purchased in the city.

Del Monte, Hotel Del Monte polo grounds.—Latitude 36° 30′ N. Longitude 121° 50′ W.

This field is 2,000 by 500 ft., adjoining the city on the south; polo grounds and race track surrounding the field.

Prevailing wind, south.

Field level and in good condition.

Gas and oil can be purchased in the city.

El Centro, Puryear landing field.—Owned by the city latitude 32° 50′ N., longitude 115° 32′ W.

Field 2,640 by 1,320 ft., located 1½ miles east of the city.

Prevailing wind, west; altitude 57 ft.; condition, good.

Was used by Army Air Service.

Gas and oil can be purchased in the city.

—(*N.A. 1, 1922.*)

Florida

Pensacola Bay—East Bay—Pensacola Naval Air Station—Beacons established.—On Jan. 17, 1922, the following beacons each an unpainted rectangular slatted daymark above a yellow platform on a pile 8 ft. high were established at Pensacola Naval Air Station, East Bay:

Beacon A, surrounded by three brace piles, located 1,250 yds. 98° from East Bay Channel Range Front Light.

Beacon B, surrounded by three brace piles, located 3 miles 6° 30′ from Beacon A.

Beacon C, located 3 miles 125° 20′ from Beacon B.

Approximate position of East Bay Channel Range Front Light, latitude 30° 31′ 45″ N., longitude 87° 01′ 45″ W.

—(*N.A. 3, 1922.*)

A Hobart Baker Memorial

There is to be erected at Princeton University an artificial skating rink as a memorial to the late Lieut. Hobart A. H. Baker, the famous Princeton football and hockey player, who during the war was a member of the Lafayette Escadrille and later Commanding Officer of the 141st Aero Squadron He was officially credited with bringing down three enemy planes, was decorated with the Croix de Guerre for "exceptional valor under fire", and met his death accidently in a flight at Toul on Dec. 26, 1918.

The Baker Memorial is to be a Gothic building which will be a credit to Princeton architecture, and the erection of same has been made possible through the donation of $100,000 by an

HOBART AMORY HARE BAKER

anonymous contributor. The estimated cost of the structure is $250,000 and with the $100,000 already assured, donations for the additional $150,000 are being obtained.

In this connection a letter sent out by Percy R. Pyne, 2nd, 1913, Chairman of the Memorial Committee says in part:

"Very little publicity has been given this fund, as the Committee in charge did not in any way wish it to interfere with the University Endowment Fund. Nevertheless, at the present writing over 225 subscriptions have been received, totaling over $35,000. The Committee has to raise $115,000 more to complete the fund, and it is hoped that a spontaneous response to this letter will be forthcoming. Subscriptions are not limited to Princeton men, nor to large sum, and many gifts have been made by graduates of other universities, as well as from men who did not go to college at all.

"This is a memorial to the finest type of American athlete and gentleman,—one who, on account of his quiet unassuming manner, his well known sportsmanship, and his Christian life and character, is an example for all Princeton men in the future.

"There will be no regular drive to obtain funds for this memorial, as the Committee feels that bringing this matter before the alumni and sportsmen generally throughout the country will be all that is necessary to complete the fund. Checks should be drawn to the order of and sent to either H. Gray Treadwell, Treasurer, in care of Tiffany & Co, Fifth Ave. and 37th St., New York City, or Percy R. Pyne, 2nd, Chairman, 20 Exchange Place, New York City."

Among the subscriptions received so far there figure the following: General John J. Pershing; Hon. Frank B. Brandegee, Senator from Connecticut; Hon. James W. Wadsworth, Jr., Senator from New York; Hon. Walter E. Edge, Senator from New Jersey; Hon. Joseph S. Frelinghuysen, Senator from New Jersey; Hon. Nicholas Longworth, House of Representatives; Hon. Ogden L. Mills, House of Representatives; Hon. Joseph C. Grew, Minister of Denmark; Hon. Hugh C. Wallace, Former Ambassador to France; Hon. Larz Anderson, Former Ambassador to Spain; General Guy Livingston, R.A.F.; Lieutenant Mandrot, French Air Service.

L. Sperry Demonstrates the "Messenger"

Lawrence Sperry recently gave a remarkable demonstration of the maneuverability of the "Messenger" airplane built by the L. Sperry Aircraft Co. to the designs of the Engineering Division, Air Service.

After having flown the machine from New York to Washington, he performed short distance take-offs and landings near the Munitions and Navy Buildings, landing with only a 50 or 60 ft. run, and taking off quickly after a run of about 75 ft. with a climbing turn.

First he landed in the drive west of the Munitions Building and then took off heading for the Lincoln Memorial which he rounded quickly flying across the mall to the Washington Monument. Returning he landed in the long basin of the reflecting pools of the Lincoln Memorial. This was the first time that a plane had landed in the basin which has never been filled with water and is covered with coarse, loose cinders.

Before a crowd of Naval and Army fliers, including Admiral Moffett, Pilot Sperry short circuited one of the three cylinders of the air-cooled Lawrance engine, and took off without difficulty, landing after a short flight into the wind. He did this, he said, to demonstrate the fact that the Messenger would run satisfactorily on two cylinders without too great vibration, which fact had been questioned.

During his flights, Lieutenant Maitland, of Bolling Field, in a Fokker entertained the crowd with aerial stunts and also landed successfully in the dry basin following Pilot Sperry.

The day following this demonstration Lawrence Sperry landed in the Capital Plaza and paid a visit to Congress. During a brief aerial entertainment he taxied his tiny ship partway up the steps of the Capitol to show that it was "a real flivver" and that it was not afraid of rough roads, curbstones, steps, etc.

One purpose of the demonstration was to show that without aerial laws, fliers will soon be landing in our front lawns, flower beds, tennis courts, etc., and not be subject to any penalties.

The cover illustration of this issue shows Pilot Sperry and Charles Lawrance, the latter the builder of the Lawrance 60 hp. engine with which the "Messenger" is fitted, near the Lincoln Memorial in Washington, where the pilot just landed.

Flying Boat Service on Pacific Coast

The Western Airway Co., recently organized in San Francisco, has inaugurated a regular passenger and freight service between San Francisco and Los Angeles with Aeromarine-Navy HS flying boats. One of these flying boats leaves San Francisco at 8:30 in the morning and another leaves Los Angeles at the same time. The fare for the total distance is $50 per passenger.

Announcement of this new aerial service was made by C. F. Redden, President of the Aeromarine Engineering and Sales Co, who have recently sold two HS flying boats to the Western Airway Co.

"Wherever there is a large body of water in the United States, Aeromarine boats have flown", said Mr. Redden, "Their distinctive white wings and hull have become a familiar sight to thousands of people and are establishing in the minds of the general public the fact that aerial transportation properly conducted is absolutely safe. We are more than gratified to see the interest taken on the Pacific Coast in Aeromarine boats, and expect as rapid developments out there as we have seen in the East and Florida."

ARMY AND NAVY AIR NEWS

Air Service

Post Field.—The third class of the Air Service Observation School at Post Field, Fort Sill, Okla., reported shortly before Jan. 15. The class is made up of fifteen Air Service officers, one officer from the Chinese Navy, and one cadet. All of these came from Carlstrom Field, where their primary training had been completed.

Work began on Monday, Jan. 16. The mornings for the first week were devoted exclusively to transition flying in De-Havilands. The afternoons were spent in the Motor Overhaul Shops, where the student officers personally tore down and reconstructed three Liberty engines, later testing them on the blocks, and "shooting trouble." These engines are to be installed in certain designated ships, and each student will fly one of the ships equipped with his own handiwork.

The course is now in its sixth week. The first four weeks were devoted strictly to flying and Liberty engines. Good progress has been made by all. The examination on engines was very practical. The ignition, cooling, lubrication and gasoline feed systems were all very thoroughly covered, and a thoroughly practical knowledge of the subject was absolutely necessary to obtain a passing grade. The fact that all obtained a grade of better than 90 per cent indicates the spirit of the class.

The fifth and sixth weeks have been devoted to flying and rigging, an equal amount of time to each. As in the case of Liberty engines, the work in rigging is practical, consisting of actual work on a ship—fitting and equipping it completely from the time it leaves the crate until it is placed in commission. This ship will also be flown by the class.

Beginning the seventh week and lasting until the end of the fifteenth week, theory will be combined with practice. The flying period of three hours each day will be taken up by flying the missions described and explained in the class room.

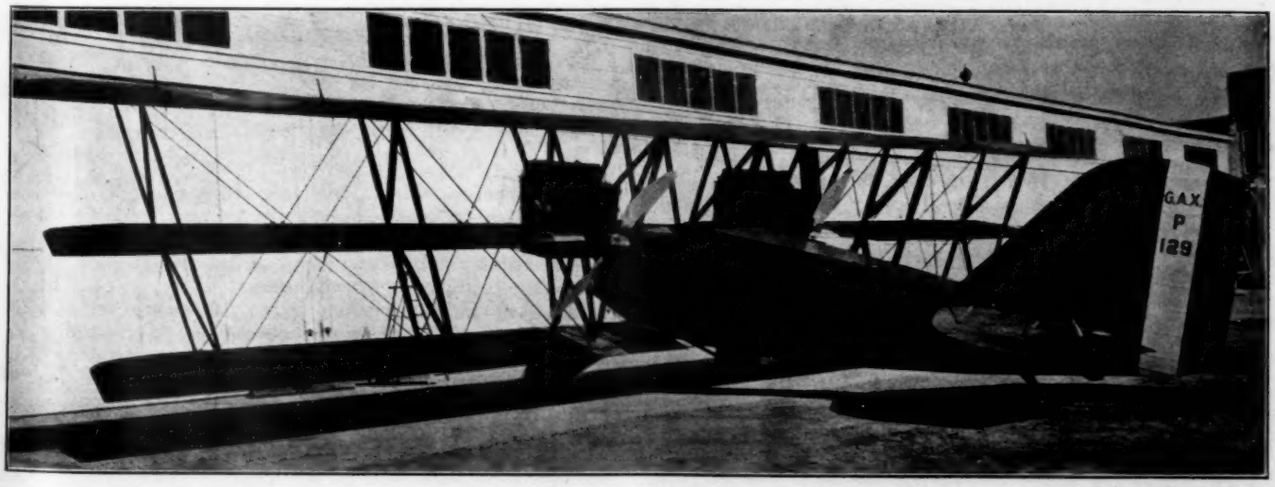
From the fifteenth week until the twenty-third and last week of the course, flying exclusively will obtain. During this period, formation flying and cross-country work will predominate. As in the last course, it is contemplated that each student will make a cross-country trip requiring at least two hops each way, the student to take a mechanic and to rely solely upon his own resources as far as navigation and flying are concerned.

Carlstrom Field.—The Field Meet held at Carlstrom Field, Arcadia, Fla., was opened with a DeHaviland formation over the field at low altitude. Art Smith, the famous civilian aviator, who is an instructor at the field, dazzled the crowd with a fine exhibition of stunt flying. He flew a Nieuport scout with smoke bombs attached to the upper wings, and made a very pretty effect. The speed race for all models was thrilling, and was won by Lieut. Hez McClellan in a DeHaviland. There were ten other events, and the two thousand spectators went away well satisfied, loud in their praise of the Air Service and more determined to keep Carlstrom which, from present indications, is destined to be abandoned and the school transferred to Kelly Field.

An event which marred the otherwise successful completion of the Meet was the death of Staff Sergt. Robert C. Washborne, who jumped with a parachute from an altitude of 3000 ft. and fell to his death because his parachute failed to open. The cause of the failure has not been determined, but a board has been convened to determine the cause of the accident.

* * *

316th Observation Squadron (Reserve).—The men of the 316th Observation Squadron of the 91st Division, Organized Reserves, U. S. Air Service, have been ordered to appear at Crissy Field, Presidio of San Francisco, Calif., for the purpose of repairing the headquarters building and hangar recently assigned to the squadron. When the work is completed the squadron will receive six airplanes that have been assigned to it. Feb. 4 and 5 were set aside as the dates on which applications for enlistment in the squadron were to be received. Thus far twenty-three officers of the Air Reserve Corps have been assigned to the 316th Squadron, viz: 1st Lieuts. August G. Rehlmeyer and Raymond W. Kerny and 2nd Lieuts. Benjamin E. Apte, Fay L. Davidson, William I. Farmer, Ronald B. Stuart, Martin P. Detels, Edward J. Hammond, Edmund L. McDonald and Gerald F. Herrman of San Francisco, Calif.; 3d Lieuts. Burdette Palmer and Leslie R. Bates of Alameda, Calif.; 2d Lieuts. Roger K. Gardner, Lynn G. Lawrence, Knox Lofland, Clark W. Crocker, Delano A. Brown and Charles L. Bowman of Berkeley, Calif.; 2d Lieuts. Henry J. Hoey, Chester R. Clarke, Wm. S. Eggleston and Howard Couch of Oakland, Calif.; and 2d Lieut. Herbert K. Henderson of Piedmont, Calif.



A GAX armored attack airplane, of which several were recently assigned the 90th Squadron, A. S. The ship was designed by McCook Field, and built by the Boeing Airplane Co. of Seattle

Mather Field.—A very successful aerial circus was staged at Mather Field, Mills, Calif., on March 19.

The circus started with a large formation of DH4B's and two SE5's arriving from Crissy Field. The next event, a 20 mile race over a triangular course, was won by Sergt. G. Eckerson, of the 28th Squadron; the other entrants came in "over the wire" in the order named: Corp. J. Larsen of the 9th Squadron, Sergt. T. J. Fowler of the 28th Squadron, Lieut. F. O. Kiel of the 91st Squadron, and Lieut. Paul L. Williams. A tug-of-war between an airplane and an Army motor truck was of short duration, the airplane easily showing its supremacy in pulling powers.

Then, at the signal of the field piece, three DH4B's began a ten-minute latitude race from a standing start. Cadet D. A. Templeman's record of 9000 ft. made him winner over Cadet N. Sternberg (8,900 ft.) and Cadet I. Igelsrude (8,800 ft.).

Lieut. E. S. Norby's exhibition of a dead-stick landing probably caused more amusing comment than any other attractions. Many of those attending knew almost nothing about flying and the start of Lieutenant Norby's ship did not occasion much interest but when that one plane was high above the Field, very evidently staying up without a sound of a motor to be heard, some of the onlookers remarked "But how could he have gotten up there without a motor?"

An exhibition of aerial warfare was participated in by Corp. J. Larsen (28th Sqdn.), who, in a reconnaissance plane, went over the "enemy lines" for observation. An enemy pursuit plane flown by Lieut. John Benton of Crissy Field, shot down the reconnaissance plane and was, in turn, shot down by an Allied Scout Plane flown by Lieut. W. C. Goldsborough of Crissy. The pilot of the wrecked reconnaissance plane leaped to safety with a parachute. Civilian parachutist Broadwick, the pioneer balloonist and whose invention the safety pack is, made the parachute jump.

* * *

5th Group (Observation).—An airplane show held by the 5th Group (Observation) at Luke Field on Jan. 21, 1922, proved to be a great success. Maj. Gen. Charles P. Summerall, commanding the Hawaiian Department, a visitor at the Show reviewed the 5th Group, after which he gave a talk to the personnel on "morale", which was appreciated by all. He was very liberal in his praise of the condition of the planes which were assembled on the flying field.

A tactical program demonstrating the different phases of aerial activities under war conditions took place on Feb. 11, on the occasion of the visit of Maj. Gen. C. P. Summerall, on a tour of inspection, accompanied by Governor Farrington of the Territory of Hawaii. All planes were on alerte. At the zero hour an HS2L seaplane took off on a reconnaissance mission, Ford's Island representing the Island of Oahu for this mission. Radio communication was established between the seaplane and the Group Radio Station and the observer of the seaplane reported the approach of the "enemy". Upon receipt of the message requesting that an air force be sent to drive off the landing parties, the alarm was sounded, the motors started and in a very short time five planes took off in perfect formation and carried out a dive attack and bombing raid in the harbor representing the "enemy". At the conclusion of the raid, the planes passed in review, all observers at salute. The commanding General returned the salute and the planes circled and landed.

Next came a bombing raid of the island by one ship over the camera obscura making four shots up wind until engaged and driven off by the Fokker. Lieutenant Miller then demonstrated the maneuverability of the Fokker. The bombing plane then carried out a radio-panel communications mission, establishing communication between the plane and radio truck set upon the field.

* * *

19th and 23rd Squadrons Scheduled for Hawaii.—The 19th Pursuit Squadron and the 23rd Bombardment Squadron will proceed for duty in the Hawaiian Department sometime in April next. Officers accompanying the 19th will be: Maj. George H. Peabody, Capt. F. I. Englin and 1st Lieut. E. S. Norby and Raymond Morrison. First Lieuts. Harold Brand and A. B. Ballard will accompany the 23rd Squadron.

Mitchel Field.—For some weeks there has been much anticipation as to what the new MB7 airplane, which was being set up at Mitchel Field, would show on its initial flight. This ship, the first of its type to be set up, is a monoplane, powered with a 300 hp. Hispano-Suiza motor. Recently this small plane was given a short initial flight. No information was given out officially as to the performance of the plane, but those who saw it in flight are of the opinion that this plane will develop unusual speed. It was also noted that the monoplane had a very high landing speed. Many of the pilots of the field are hoping for an opportunity to fly this speedy little bus.

Mitchel Field has been actively engaged in recruiting for some time, but the past week saw the most novel experiment in Air Service recruiting publicity yet tried out. A message setting forth the opportunities the Air Service offers those desirous of enlisting was broadcasted by means of the radiophone. Thus it was possible for everyone for miles around and ships far out at sea to hear Mitchel Field's call for two hundred men. After sending out the call, the field is now determined to back up every statement made, in order that men reporting to this station for enlistment will not be disappointed in their desire to learn a technical trade to which they may turn upon going back to civil life.

* * *

Major Hickam Speaks in Baltimore.—Speaking at the meeting of the Flying Club of Baltimore on March 22, Maj. Horace M. Hickam, A.S. said that battle lines like the "Hindenburg Line" and others of the World War would be unable to stop the attack of aircraft due to the rapid advance in planes and flying in the past few years.

"If another war should occur," Major Hickam said, "the fighting can be carried to any part of the enemy's country by airplanes. Experiments off the coast last summer proved that airplanes can meet capital ships effectively, provided there are organized aerial units in existance, and they are properly located. A fleet is always ready, and can go into action on two weeks notice, but aircraft units cannot be organized and equipped or trained in two weeks to meet such an enemy fleet. We must have organized efficient units of several types," he said.

"If our Navy is scrapped below the 5-5-3 ratio," Major Hickam declared, "our air forces must not be neglected. With equal navies we are undoubtedly secure, but England with her navy and her organized air force could swamp this country, which has no fighting air force."

Turning his attention to commercial aviation, Major Hickam spoke of the great saving in time affected by an airplane service between New York and Chicago. This is especially valuable, he pointed out, when documents must be transported from one city to another at the greatest possible speed. The development of commercial aviation in this manner, he pointed out, will furnish a big reserve power to draw on in case of war.

That the airplane has not been brought to the highest point of its development was his belief. He predicted that the airplane will do as much to change the mode of living as the automobile.

* * *

22nd Squadron.—Plans have been received from the Commanding General of the Fourth Corps Area in regard to the proposed work of the 22nd Squadron during the summer. The squadron will take charge of the instruction of the R.O.T.C,. Air Service, which camp will be located at the Montgomery Air Intermediate Depot, Montgomery, Ala. The squadron will also work with the Citizen's Military Training Camp, which will be located either at Camp Benning or at Camp McClellan, Anniston, Ala. It will also take care of all the aerial observation for the National Guard Camp at Camp McClellan. It is planned for the National Guard Field Artillery to be stationed at Camp McClellan, which will give the observers and pilots of this squadron an opportunity to work with that unit in the adjustment of their guns. The Engineers have made request for the squadron to photograph areas on the Gulf of Mexico.

Joint Training of Coast Artillery and Air Service.—The War Department is taking action to insure coordination of the Coast Artillery and the Air Service in coast defense, under the basic principles of warfare and training recently laid down. The chiefs of the two combatant arms concerned have been instructed to consider together the question of joint training, with a view to carrying out experiments in joint training and tests of material during the coming summer.

The war with Germany furnished such an exhaustive test of the powers of mobile troops that the doctrines of training for such troops were firmly established. Coast defense, however, was not so extensively tested, and many questions of the best methods and material to be used were not solved in battle. Since the war various experiments, such as the bombing of warships, have indicated the increasing power of aircraft in coast defense. It is with a view to developing the potentialities of this new arm, as well as to insure properly coordinated training, that the War Department is taking action.

Both branches undoubtedly have an important role in coast defense, and tests will be for the purpose of obtaining coordination in their training. It is expected these tests will include:—

(a) Anti-aircraft target practice against air targets to determine the vertical range at which bombing planes could operate without being subjected to effective fire.
(b) Bombing practice against coast defense installations to determine the effect of aircraft bombs on such a target.
(c) Combined target practice at extreme coast artillery ranges to determine the relative efficiency of bombing planes and large caliber coast artillery guns in operation against an enemy fleet.

* * *

Report on Roma Accident.—The official report on the Roma accident has been forwarded to the Secretary of War by Maj. Gen. M. M. Patrick and may shortly be made public. The report covers a minute examination of the frame of the keel of the Roma, testimony of eye witnesses and a study of the structure of the airship by a board headed by Lt. Col. Arthur G. Fisher, A.S.

* * *

MacReady to Better His Record.—Lieut. J. A. MacReady recently announced that he is planning to attempt to better the world's airplane altitude record of 40,800 ft. which he established at Dayton last September.

Naval Aviation

Award of Engine Contract.—The Navy has awarded the Steel Products Engineering Co. of Springfield, Ohio, a contract for five 200 hp. aircraft engines, with preliminary plans and designs. The bids which were opened on Feb. 28 called for a six-cylinder engine developing 200 hp. at not exceeding 1700 r.p.m. This engine, known as the Rausie E6 is from designs of L. E. Rausenberger, chief engineer of the Steel Products Engineering Co.

* * *

Acceptance Tests of Curtiss Torpedoplane.—Acceptance tests of the new Navy Curtiss CT torpedoplane were conducted at the Anacostia Naval Air Station on March 23-24 with most satisfying results, it is learned. The monoplane flew over the city and over the river nearly all of both days, executing the various maneuvers prescribed by the manufacturers tests, among them the carrying of weights.

* * *

Navy Rejects Offer of R36.—That the British rigid airship R36, turned over to the Aircraft Disposal Board for sale, was offered to the Navy Department, but the Department was not in a position to accept the proposal, was learned of the Navy Department following the advertisement in the *Press*.

The R36 was designed about four years ago as a military airship, but before completion was converted into a passenger-carrying airship and placed under the control of the civil side of the Air Ministry. She was built in 1921 and after passing her trial flights successfully was utilized for demonstration purposes and made a number of successful flights in England last year. It was proposed to carry out demonstration flights to Malta and Egypt, and later to India and Australia. Owing to shortage of funds and lack of cooperation in the British Colonies these flights were not made.

The R36 was built by William Beardmore & Co., Ltd., well known shipbuilders on the Clyde, and has the following characteristics:

Length	672 ft.
Maximum diameter	78 ft. 9 in.
Cubic capacity	2,100,000 ft.
Nominal lift	63.8 tons.
Maximum speed	65 m.p.h.
Normal cruising speed	50 m.p.h.
Range	Over 4000 miles.

Two important features of R36 are her passenger accommodation and the bow mooring gear. The normal complement of R36 is 4 officers and 24 men. A full wireless equipment is carried and all the engine-carrying cars are in telephonic communication with the control car. It is possible to walk from any one part of the ship to any other. The passenger car is designed to carry 52 passengers.

* * *

Admiral Moffett on the Loss of Miss Miami.—Following the loss of the Miss Miami, Admiral Moffett, Chief of the Naval Bureau of Aeronautics, pointed out that the passengers might all have been saved if the craft had been equipped with wireless. He said:

"All airplanes carrying passengers should be required by law to be equipped with radio. The loss of this plane off the Florida coast is an additional proof, if any were needed, of the urgent need of the passage of the bill now before Congress, creating a Bureau of Aeronautics in the Department of Commerce, for the regulation of commercial aviation. Legislation for this purpose has been recommended by the President, and strongly urged by the Army, the Navy, the National Advisory Committee for Aeronautics, and representatives of the aircraft industry. Until such a law is passed, there is no way of requiring the use of radio in passenger carrying planes, for licensing of planes and pilots, and in general for safeguarding life in the air."

Coming Aeronautical Events

AMERICAN

Apr. 24 — Fourth Aviators' Ball, Hotel Astor, New York. Tickets: 80 W. 40th St.
Apr. 30 — Spring Show and Opening Meet, Curtiss Field, Mineola, L. I.
May 30 — Fourth Annual Aircraft Exhibition, Logan Field, Baltimore, Md.
May 31 — National Balloon Race, Milwaukee.
June 15-17 — Flying Meet, Monmouth, Ill.
Sept. 4 (about) — Detroit Aerial Water Derby, Detroit. (Curtiss Marine Flying Trophy Competition.)
Sept. 15 (about) — Detroit Aerial Derby, Detroit. (Pulitzer Trophy Race.)
Sept. 30 — First Annual Interservice Championship Meet. (In preparation.)

FOREIGN

August — Coupe Jacques Schneider. (Seaplane speed race.) Naples, Italy.
Aug. 6 — Gordon Bennett Balloon Race, Geneva, Switzerland.
Aug. 9-24 — Soaring and Gliding Competition, Gersfeld, Germany.
Sept. 22 — Coupe Henri Deutsch de la Meurthe. (Airplane speed race.) France.
American elimination trials, if required, to be held about Aug. 15, at Mitchel Field, L. I.

Foreign News

Great Britain

In the report of the Committee on National Expenditures, headed by Sir Eric Geddes, which was issued on February 10, it is stated that a reduction of £175,000,000 must be made in the expenditure for 1922-23. Of this sum it is recommended that a reduction of £46,500,000 be made in the cost of the fighting services, viz: £21,000,000 in the Navy, £20,000,000 in the Army, and £5,500,000 in the Air Force. The estimates for the Royal Air Force for 1921-22 were £18,411,467. For 1922-23 they are only £12,957,300, a reduction of approximately £5,500,000.

During a discussion had in the British Parliament concerning the operations of the Royal Air Force, figures were submitted showing that during 1921 the mileage flown by service aircraft was approximately 5,000,000 miles.

The British Air Force has 1,938 airplanes, of which 773 are actually in active use in squadrons and training units. Of the planes in active use, from 70 to 75 per cent may be reckoned upon as being in condition for field service. Airplanes in active use and in reserve comprise such types as the Snipe, Avro, Bristol Fighter, DH9A, DH10, Vickers Vimy, F2A, F5, Vickers Ambulance, Vickers Vernon, Fairey 3D, Fairey 3C, Westland Walrus, Sopwith Cuckoo, Panther, and Sopwith Camel.

As regards the personnel, there are 2,926 officers and 26,207 men in the Royal Air Force. Of the officers, 2,398 are on the General List and 528 on the list for non-flying duties, namely, stores, medical, etc. All officers on the General List are liable to employment on flying duties, if medically fit, and at present 1,862 are fully qualified pilots. The remainder (536) are not qualified pilots and consist partly of observers and partly of technical officers who were retained for the interim period only, including 200 Naval Warrant Officers completing their time to qualify for pension. Of the above mentioned personnel, 2,089 officers and 19,506 men and boys under training are employed in the British Isles.

Spain

A Reuter dispatch from Madrid states that the Spanish Minister of War has submitted to the Cabinet a proposal providing for the appropriation of 175,000,000 pesetas for the creation of an air force of 10 squadrons, consisting each of 18 machines of average size and of six "giant" machines for bombing purposes.

Sweden

Sweden plans to hold an international aircraft exposition at Gothenburg in the summer of 1923, for the purpose of creating public interest in aeronautics. A report has been received from Maj. Benjamin D. Foulois, on duty as assistant military attaché at Berlin, Germany, on his participation in an aeronautical conference held at Gothenburg during the week Dec. 12-17, 1921, to discuss the plans for the aero exhibition, which is to be connected with and form a part of the jubilee exposition celebrating the 300th anniversary of the founding of Gothenburg.

Major Foulois states that the members of the Swedish Royal Aero Club, officially in charge of the 1923 aero program, expressed their great appreciation for the interest evidenced by the U. S. Air Service in sending an official to Gothenburg for the purpose of conferring with them, adding that they are extremely anxious to have American aircraft exhibitors and American airplanes take part in both the Aircraft Exposition and in the international flying contests. While appreciating the disadvantages of the long distance between the United States and Sweden, they point out that there is a direct line of steamers running between New York and Gothenburg, and, further, that every possible preference will be given to American exhibitors in connection with freight rates, etc.

The Secretary of the 1923 Aero Exhibition, C. R. Cramer, of Gothenburg, is extremely anxious to have the exhibition advertised as broadly as possible in the United States, stating he will furnish all details to American exhibitors upon application.

Where to Fly

CALIFORNIA
SAN FRANCISCO, CALIFORNIA
EARL P. COOPER AIRPLANE & MOTOR CO.

ILLINOIS
CHECKERBOARD AIRPLANE SERVICE
FOREST PARK, ILLINOIS

INDIANA
One of the largest and best equipped flying fields in the United States.
CURTISS-INDIANA COMPANY
Kokomo, Indiana
ALL TYPES OF CURTISS PLANES.

MASSACHUSETTS
BOSTON AND SPRINGFIELD, MASS.
EASTERN AIRCRAFT CORP.
340 FIRST ST., BOSTON, MASS.

MINNESOTA
WHITE BEAR LAKE, MINN.
The Twin Cities' chief summer resort.
Harold G. Peterson Aircraft Company
SCHOOL OF AVIATION

NEW JERSEY NEW YORK AIR TERMINAL
800 Acres — 6 miles from Times Square.
Learn on ships that cannot tail spin. Planes rented $30. *hr.*
CHAMBERLIN AIRCRAFT
Hasbrouck Heights, N. J.

NEW YORK & NEW JERSEY
CURTISS FIELD, GARDEN CITY, LONG ISLAND
KENILWORTH FIELD, BUFFALO, N. Y.
FLYING STATION, ATLANTIC CITY, N. J.
CURTISS AEROPLANE & MOTOR CORPORATION

NEW YORK
AEROMARINE AIRWAYS, INC.
Times Building, New York
11 Passenger Flying Cruisers -- 5 passenger, open and enclosed Flying Boats. Sightseeing Tours - Flights to Shore and Lake Resorts

OHIO
DAYTON, OHIO.
Supplies, Hangars, Shops and Field 1 Mile from Dayton limits.
JOHNSON AIRPLANE & SUPPLY CO.

OREGON
LAND OR WATER FLYING
OREGON, WASHINGTON AND IDAHO AIRPLANE COMPANY
PORTLAND, OREGON

PENNSYLVANIA
Flying School and Commercial Aviation
Send for Circular
Official Flying field Aero Club of Pennsylvania
PHILADELPHIA AERO-SERVICE CORPORATION
636 Real Estate Trust Building, Philadelphia.

WISCONSIN
CURTISS-WISCONSIN AEROPLANE CO.
FLYING SCHOOL
Milwaukee Air Port
GILLES E. MEISENHEIMER
330 Clinton Street Milwaukee, Wis.

If you are one of the companies in your state having first class facilities for passenger carrying, pilots' training and special flights, you should be represented in WHERE TO FLY each week.

26 Consecutive Insertions $20.00